MEDICAL EDUCATION AND RESEARCH NEEDS IN MARYLAND

nittee on Medical Care

Maryland State Planning Commission

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REPORT OF THE SUBCOMMITTEE ON MEDICAL EDUCATION AND RESEARCH

MEDICAL EDUCATION AND RESEARCH NEEDS IN MARYLAND

COMMITTEE ON MEDICAL CARE
MARYLAND STATE PLANNING COMMISSION

JANUARY 1962

MARYLAND STATE PLANNING COMMISSION

State of Maryland

DEPARTMENT OF PLANNING and PLANNING COMMISSION

STATE OFFICE BUILDING
301 W. Preston St.
Baltimore 1, Md.

January 2, 1962

The Honorable J. Millard Tawes
Governor of Maryland
Annapolis, Maryland

Dear Governor Tawes:

The Committee on Medical Care recently adopted the accompanying report, and it is transmitted to you through the State Planning Commission. This report analyzes some of our major future needs with regard to medical education.

Of prime importance in this report is the expressed need in Maryland for a 49% increase in medical school enrollment by 1971. This means the enrollment of 92 more first-year students, which includes the 28 planned by the University of Maryland for next September. This total is nearly equivalent to the enrollment of an average medical school.

Because of the widespread implications of this report, copies will be sent to all concerned, as suggested by the letter of transmittal from the chairman of the Committee on Medical Care.

Sincerely yours,

James J. O'Donnell

JAMES J. O'DONNELL
Director, Planning Department

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State of Maryland

DEPARTMENT OF PLANNING and PLANNING COMMISSION

STATE OFFICE BUILDING
301 W. Preston St.
Baltimore 1, Md.

October 18, 1961

Mr. Joseph Meyerhoff
Chairman, State Planning Commission
State Office Building
Baltimore 1, Maryland

Dear Mr. Meyerhoff:

I am pleased to submit a report from our Subcommittee on Medical Education and Research. This report was adopted by the Committee on Medical Care at its October 17, 1961 meeting.

The report contains recommendations which apply to a large number of persons, organizations and institutions including medical societies, college and university trustees and administrators, medical schools, hospital trustees, hospital associations, as well as the executive and legislative branches of government. The Committee hopes that the report, and in particular the especially pertinent sections, will be brought to the attention of all who are concerned.

In line with the subcommittee's recommendation that the Committee on Medical Care appoint a subcommittee to ascertain the feasibility of meeting future needs by the development of a school of basic medical sciences in Maryland, this is to advise that such a subcommittee is in the process of organization.

Sincerely yours,

George H. Yeager.

GEORGE H. YEAGER, M.D., *Chairman*
Committee on Medical Care

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Chief, Committee on Medical Care

State of Maryland

DEPARTMENT OF PLANNING and PLANNING COMMISSION

STATE OFFICE BUILDING
301 W. Preston St.
Baltimore 1, Md.

September 26, 1961

George H. Yeager, M.D.
Chairman, Committee on Medical Care
State Planning Commission
State Office Building
Baltimore 1, Maryland

Dear Dr. Yeager:

It is my pleasure to transmit the report of the Subcommittee on Medical Education and Research. This study, done at the request of the Committee on Medical Care, examines some of the medical education needs in Maryland through 1975.

I wish to express my gratitude to the members of the subcommittee whose informed and conscientious participation in the discussions held during the past year have resulted in this report.

I know, too, I speak for the members of the subcommittee, as well as myself, in expressing our debt to Marshall W. Raffel whose competence, diligence, and expert knowledge of the field were elements of primary importance in all our deliberations and in the preparation of the material.

Sincerely yours,

Morris Lieberman

RABBI MORRIS LIEBERMAN, *Chairman*
Subcommittee on Medical Education
and Research

ACKNOWLEDGMENT

The subcommittee and its staff wish to acknowledge the invaluable assistance provided by its technical consultants at various stages in the deliberations: Alan M. Chesney, M.D.; Frederick W. Barnes, Jr., Ph.D., M.D.; Arthur L. Roberts; Dietrich C. Smith, Ph.D.; Patrick B. Storey, M.D.; Matthew Tayback, Sc.D.; Ralph J. Young, M.D.

The subcommittee and its staff are especially indebted to William H. Stewart, M.D. (Chief, Division of Public Health Methods, U.S. Public Health Service) who worked with us throughout the study and was of inestimable help; and to Thomas Parran, M.D. and William C. Rappleye, M.D. for their extensive critiques of the draft report.

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PREFACE ON MEDICAL EDUCATION

". . . provincialism in this regard would be most short-sighted, since the nation as a whole will need doctors—well trained ones. In many of the areas where doctors are needed and students desire to have a medical education, it would be highly impractical to establish schools. In some states, and Massachusetts is one, education, particularly medical education, is excellent, and to these areas the nation must turn for a large share of additional physicians. Furthermore, one of the reasons why we have a favorable doctor-patient ratio in this state is because we turn out a large number of able young doctors and can provide attractive circumstances for practice, teaching, and research. The necessity for maintaining this competitive position is obvious . . . good hospitals and good medical schools set a pattern of leadership in medicine that exerts a beneficial effect on every practitioner in the State. If we lose that position by failing to create schools and hospitals in anticipation of conservatively estimated need, we will fall behind other regions that will have been more forehanded in their planning."

The Boston Medical Quarterly,
March 1961

CHAPTER ONE

SUMMARY OF MAJOR CONCLUSIONS AND MAJOR RECOMMENDATIONS

Introduction

Reports are current of communities which are without physicians, of hospitals which cannot secure interns, and of dependence upon foreign trained medical graduates. At a time when the public is more health conscious and increasingly able to purchase the care desired, these reports cause public anxiety as well as concern in the medical profession and in government circles. The apparent shortages come at a time when the population is numerically exploding, when longevity creates new and greater problems in medical care of the aged, when medical research offers promise of enabling physicians to treat effectively many more medical problems, thus creating a greater demand for medical service.

National studies have concluded that unless new medical schools are established and unless present schools enlarge their programs, our nation will face a critical shortage of physicians.

Motivated by this widespread concern and by the conclusions of these national studies, the Committee on Medical Care initiated this study. Its purpose is to determine what Maryland's proper responsibility should be for the education of physicians to meet our 1975 needs. In considering this matter we touched upon, and have dealt with, several major related issues such as foreign medical graduates, graduate and postgraduate medical education opportunities, medical research, Ph.D. needs, financial support for medical students, and the health of the Negro population.

Major Conclusions

1. Does Maryland need more doctors today?

Despite a popular notion to the contrary, there is no overall shortage of physicians in Maryland today. Reported shortages in some communities and in some specialties are the result of distribution problems, rather than of any gross shortage of physicians. (See: pages 16-24, 76-83)

2. Isn't a current shortage of physicians indicated by the inability of hospitals to get the residents and interns they need?

The reported intern and resident shortage should not be construed as evidence of a physician shortage. This can be appreciated when one considers what the proper function and purpose of the internship and residency programs are. The internship and residency are properly and primarily an educational experience. Provision of medical service by the house staff is an intimate and undissociable part of this educational experience, but cannot be justified except as it relates to the basic purpose of education. Medical schools do not, and should not, exist to supply hospitals with interns or residents. Immediate hospital needs for medical service coverage can be met, without any marked adverse effect upon the supply of physicians, by the part time or full time employment of physicians for this purpose, or by distributing the duties among the attending medical staff. (See: page 22f)

3. Don't we need more doctors to handle the health problems of those Negroes, and others, in the lower socio-economic group?

Serious health problems exist among the Negro population, and we suspect among others in the lower socio-economic group. While additional physicians may be necessary to assist in providing for their medical care requirements, the chief deterrents to good health seem to rest with a lack of knowledge both about the services which are available and the fundamental practices essential for personal health, a shortage of hospital beds available for Negro patients, and the economic pressures which do not permit adequate diet or housing. (See: page 23f)

4. Doesn't the large number of foreign physicians who are licensed each year indicate a physician shortage?

The large number of foreign medical graduates licensed each year is not evidence of any present physician shortage. Dependence upon this immigration, however, is cause for concern since any marked decrease in this physician supply will preclude our maintaining the national standard of 133 physicians per 100,000 population. The nation should aspire to maintain the present physician/population ratio from domestic sources, regardless of an increase or decrease in this immigrant physician manpower. In no sense, however, should foreign physician immigration be curtailed. In view of the aging and younging population, and the increased demand for medical care as the standard of living rises generally, we suggest that the added resource of immigrating physicians can always be used advantageously. (See: pages 27-31)

5. What should be Maryland's responsibility for the education of future physicians?

Maryland should obligate itself to graduate in 1975 at least the same ratio of physicians to national population as were graduated in 1959 by the University of Maryland and The Johns Hopkins University schools of medicine. To this 1975 responsibility of 204 physicians should be added Maryland's proportionate share in replacing foreign medical graduates on whom we are now dependent for maintenance of present standards (Maryland's share being 36 physicians per year). This means that Maryland, to meet its 1975 national obligation, must graduate 240 physicians per year. To allow for attrition and thus secure the required number of graduates, we will require no later than 1971 (for 1975 graduation) approximately 282 first year medical students. This is 49%, or 92 students, more than the entering classes last September. There exists the potential for greater effort should the State wish to assume it.

This national perspective is dictated by the fact that this nation has a highly mobile and expanding population. It is further dictated by the fact that half of the nation's medical schools are private with no commitments other than to the nation as a whole. Because of such factors we are convinced that Maryland's future need for physicians can only be met as the national need is met.

Some states, however, because of their small or homogeneous population, cannot support a medical school from the clinical viewpoint. Their needs, as well as the needs of the armed forces, must be met by those states which have a surplus of clinical resources. In particular, the greatest effort should be made in those states which have no medical school, and yet the clinical and educational resources to support one. The greatest effort should also be made in some of the heavily populated states which have only one or two medical schools, and yet possess the clinical and educational resources to support more. Neither of these groups is carrying its share of the national burden at this time. (See: pages 15-19, 24-27, 31f)

6. What plans for the future have been made by Maryland's two medical schools?

With a view to the future and for the needs of the nation, Maryland's two medical schools, The Johns Hopkins University and the University of Maryland schools of medicine, have plans for expan-

sion which will enable them to maintain their already accelerated growth. Between them plans have crystallized for the annual enrollment by 1962 of 40 additional first year medical students, for a total of 218 students. This falls short of the required 282 students by 64. Both medical schools could accommodate more students in the third year were there a school of basic medical sciences to supply them. (See: pages 26f, 69f)

7. How can Maryland's full responsibility for an additional 64 students be met?

There are three possible ways by which we might provide the 64 openings for first year medical students, and thus meet our national responsibility—a school of basic medical sciences, a third medical school, or further enlargement of the present medical schools (See: pages 33-52):

a. A school of basic medical sciences trains people for the first two years of medical education. The students then transfer to the third year class in a 4-year medical school. The 4-year school can take in such transfer students due to vacancies created by dropouts in the first two years and also due to the fact that medical school programs are readily expandable in the clinical (last two) years. The school of basic medical sciences has many advantages: it is not as costly as a 4-year program; it can expand into a 4-year school if the need develops; by filling out the third year classes in the 4-year schools it provides for the most efficient use of physical plant and clinical resources of those 4-year schools; it provides a mechanism for educating medically oriented Ph.D.'s who are sorely needed.

b. A third medical school would permit the enrollment of many more than 64 students and would enable Maryland to do even more toward meeting the national goal. In view of our extensive clinical resources, the cost of such a school would be moderate, as medical schools go, though considerably more costly than a school of basic medical sciences. A medical school offers many advantages beyond the provision of more doctors: through its teaching programs it helps improve medical care in the community; it attracts outstanding people to serve as citizens in the community; it is an industry pro-

viding jobs and tax revenue; it can help further our reputation as a great medical center.

c. Further enlargement of the first year classes in the present medical schools is possible. However, the schools are built and oriented to a certain class size. Any further enlargement beyond what is presently planned would require expansion both of the faculty and of the physical plant, and, in this regard, it should be borne in mind that there is a point beyond which it is not academically and administratively desirable to expand. If such expansion were possible, however, this approach to our national responsibilities would be the least satisfactory of all. Suppose, due to the unforeseen, our needs are greater than the 64 additional students? What happens after 1975? Such expansion would not, moreover, allow for greater national and international efforts.

The possible limitations on the expansion of the present schools suggest a fourth way by which to achieve our goal—i.e., a combined approach employing some first year expansion of the present schools plus a 2-year school of basic medical sciences.

8. How do graduate and postgraduate medical education opportunities affect a state's ability to meet its need for physicians?

The availability of good graduate and postgraduate medical education opportunities is an increasingly important factor in attracting physicians to a given area. When such opportunities are present, the necessary intellectual and scientific environment exists for the development and transmission of new medical knowledge. Physicians recognize that the acquisition and application of new knowledge are essential to the practice of good medical care—hence, the attraction to areas which abound with graduate and postgraduate opportunities. (See: pages 61-63, 84-91)

9. Are enough students preparing themselves for medical studies?

Not enough college students are interested in, and not enough are suitably prepared for, the study of medicine and graduate study in the medical sciences. The high cost of medical education prevents many from considering medical studies. In other scientific areas the length of training is shorter, scholarships far more plentiful,

the prestige high, and the income potential of the graduate commensurate with that of physicians. (See: pages 65-73)

10. Is the potential of our Negro population fully utilized?

The potential of our Negro population is not being fully utilized. College undergraduate programs of quality are not as readily available to them. The qualified Negro student may see no reason to study medicine in large part because internships, residencies, and medical staff appointments in hospitals are generally denied to him. (See: pages 73-75)

Major Recommendations

1. The planned expansions at the two medical schools should be given full and prompt support from the Maryland state government as our minimal contribution to the state and national need for physicians. In addition, the trustees of both universities should direct that a study of the medical school programs be made to see if the schools, between them, cannot by 1971 further absorb 22 students in their entering classes. This would assure fulfillment of our minimal national obligation to graduate by 1975 the same ratio of physicians as we graduated in 1959. This re-study should include consideration of any necessary physical plant expansion to attain the required added admissions, with support from federal and state funds.

2. Schools of basic medical sciences are needed nationally. The feasibility of meeting future needs by such a school in Maryland, with a class size of at least 42 students, should be determined at once. Since our two medical schools will be able to take additional students in the third year, regardless of whether they enlarge their entering classes, a 2-year school would thus provide for maximal development of our medical schools and for greater effort in meeting national and international needs, while at the same time helping to overcome the dangerous dependence upon foreign trained physicians. A 2-year school would allow for the education of more Ph.D.'s in the basic medical sciences, doctorates now in short supply. A 2-year school would provide the basic framework for development of a 4-year school should the present medical schools be unable to expand sufficiently or should the need otherwise arise. The State of Maryland should be prepared to grant substantial financial assistance toward the development of this school.

Since the structuring of a medical curriculum is involved, since medical school affiliation is highly desirable, and since appropriate clinical affiliations are mandatory, the Committee on Medical Care should appoint a select subcommittee of medical educators to ascertain which college campuses in Maryland would be most appropriate for the needed school of basic medical sciences and the mechanism by which it might be achieved. The subcommittee should have at its disposal the report of the Hopkins and Maryland trustees indicating the extent to which those medical schools might expand.

The subcommittee does not believe that a 2-year school is feasible at this time on the campuses of either The Johns Hopkins University or the University of Maryland since both schools have unmet operating and capital budget needs; in addition, there is the possibility of undesirable competition between a medical school and a school of basic medical sciences under the same administration.

3. Pre-medical and other scientific curricula should be strengthened in colleges throughout the state both qualitatively and quantitatively in order to stimulate interest in the medical sciences. This should receive early attention by the trustees of colleges in Maryland.

4. Increased scholarship and loan funds are desperately needed to attract medical students and to assist them through their extensive period of medical education. Such funds should be provided from federal, state, industrial, business, and philanthropic sources. At the present time other fields are receiving financial aid not now available to medical students; this serves as a deterrent for those who might otherwise embark upon medical studies. Our ability to meet future manpower needs will depend upon our ability to attract good students. The deans of the two medical schools should jointly develop a plan for state action should the pending federal legislation not be fully adopted, and they should also consider what steps might be taken to augment industrial, business, and philanthropic support.

5. The potential of our Negro population should be more effectively employed by the strengthening of educational programs, and by accelerating the trend toward equal opportunity as regards admission to medical schools, and as regards the availability of internships, residencies, and hospital staff appointments. Leadership responsibility for correction regarding internship, residency, and staff appointment opportunities rests with a number of people and

organizations, each of which must meet this responsibility in the immediate future: hospital trustees, The Hospital Council, hospital medical staffs, Medical and Chirurgical Faculty, and the State Department of Health. The State Department of Health, in partial fulfillment of its legal responsibility for the public's health, should bring together representatives from each of these groups to discuss the problem collectively, and to issue a joint report as soon as possible on action that is contemplated.

6. The State Board of Health and Mental Hygiene should direct that priority be given to an exhaustive study of Negro health and of the health of others in the lower socio-economic group with a view to the problems of physician distribution and availability.

7. Increased opportunities should be provided to all physicians for bedside postgraduate instruction. Participation by all physicians in such postgraduate medical education programs is a *sine qua non* for the maintenance of quality in medical care. The State should look with favor to the support of experimental projects in graduate and postgraduate medical education.

CHAPTER TWO

MARYLAND'S NEED AND RESPONSIBILITY FOR PHYSICIAN EDUCATION

Conclusions and Recommendations

Conclusions

1. Physician/population ratios are a useful index to project the national need for medical manpower. Physician/population ratios are generally *not* a useful index as to a state's need. A state's need for physicians can only be ascertained by balancing a number of indices. These indices do not readily lend themselves to a projection as to future physician needs.
2. Medical schools, even when state supported, should be viewed primarily as national resources.
3. With allowance for distribution shortages, there is no overall shortage of physicians in Maryland today. Maryland's need for physicians in 1975 can only be met if the State assumes its share of the responsibility to meet the national need for 133 physicians per 100,000 population.
4. Maintenance of the physician/population ratio at the present time depends heavily upon the annual licensing of foreign medical graduates. This dependence is not a satisfactory situation. The nation should aspire to maintain the present physician/population ratio from domestic sources regardless of an increase or decrease in this immigrant physician manpower. In no sense, however, should foreign physician immigration be discouraged. In view of the aging and younging population, and the increased demand for medical care as the standard of living rises generally, we suggest that the added resources of immigrating physicians can always be used advantageously.
5. Maryland should obligate itself to graduate in 1975 at least the same ratio of physicians to national population as were graduated in 1959 by the University of Maryland and The Johns Hopkins University schools of medicine. To this 1975 responsibility should be added Maryland's proportionate share (36) in replacing foreign medical graduates on whom we are now dependent for maintenance of present standards. This means that Maryland, to meet its 1975 national obligation,

must graduate a total of 240 physicians per year. To allow for attrition this will require approximately 282 first year medical students. This is 49%, or 92 students, more than the entering classes last September.

6. There would appear to be serious health problems among the Negro population, attributable not so much to any physician shortage as to deficiencies in health education efforts, a shortage of hospital beds for Negro patients, and the economic pressures which do not permit adequate diet or housing.

Recommendations

1. To fulfill our 1975 national obligation for 240 physician graduates per year, the already planned expansions at the two medical schools (to permit a combined class enrollment of 218 students) must be initiated immediately. In addition to this, a total of approximately 64 students must begin their medical studies as soon as possible, but no later than 1971, for 1975 graduation. This can be achieved in one of four ways:
   a. expansion of the present schools by 64 first year students
   b. development of a school of basic medical sciences
   c. combination of *a* and *b*
   d. development of a third medical school
2. The State Board of Health and Mental Hygiene, in partial fulfillment of its legally assigned function to "have care of the health interests of the people of this State," should direct that priority be given to an exhaustive study of Negro health and the health of others in the lower socio-economic group with a view to the problems of physician distribution and availability.

Maryland's Need and Responsibility for Physician Education—Discussion

Introduction

Three recent federal reports * cited the great need for expanded programs of medical education to provide enough physicians for care of our rapidly increasing population. These reports, as well as other studies of this problem, determined need on the basis of the ratio of physicians to population.

* *Federal Support of Medical Research*, Report of the Committee of Consultants on Medical Research, Boisfeuillet Jones, Chairman; Senate Committee on Appropriations, May 1960;

Commenting on some of these reports, the American Medical Association's Council on Medical Education and Hospitals said: *

> Although the resulting estimates have differed in degree, they all indicate clearly that there will be required a significant increase in the number of physicians graduated to maintain the present ratio. The projected increment for 1975 over present numbers of medical graduates range from 2,000 to 3,500. In general, the smaller estimates were made earlier when population projections were at a lower level. However, the highest estimate includes factors other than the simple linear relationship between the anticipated population growth and the number of medical school graduates.
>
> It is expected that in 1960 there will be approximately 7,000 graduates of U.S. medical schools. In view of the estimates referred to above, should the goal for 1975 be 9,000 or 10,500 annual graduates? Because of the potential for error inherent in estimates of this nature which can be significantly altered by many factors—particularly economic ones with their inevitable effect on birth rates—it would seem reasonable to accept as the present goal for 1975, the need for 10,000 graduates from our medical schools.

Educational Facility Requirements

It is important to recall that the general population whose medical service needs must be satisfied will not suddenly change between 1974 and 1975. The population growth will occur on a daily, monthly and annual basis gradually and persistently increasing to the projected total of 235 million by 1975. Similarly, the expansion in educational facilities in medicine should take place gradually and persistently. This will allow for periodic adjustment of the goal of 10,000 graduates by 1975 in keeping with any gross changes in population projections that occur.

Physicians for a Growing America, Report of the Surgeon General's Consultant Group on Medical Education, Frank Bane, Chairman; U.S. Department of Health, Education and Welfare, Public Health Service, October 1959;

The Advancement of Medical Research and Education, Final Report of the Secretary's Consultants on Medical Research and Education, Stanhope Bayne-Jones, Chairman; Office of the Secretary, Department of Health, Education and Welfare, June 27, 1958.

* JAMA, Vol. 171, No. 11 (Nov. 14, 1959), p. 1509.

The fundamental issue does not involve the question of which of the various studies have resulted in the most accurate estimate of the need for increased numbers of medical school graduates. The basic and urgent concern is that all estimates indicate a need for expansion of educational facilities in medicine in a brief period which far exceeds any expansion of such facilities that has occurred in a similar period during modern times.

There are three methods which can be used to meet the need for expanded educational facilities in medicine. They are (1) expanding the capacity of existing medical schools, (2) the development of new medical schools, and (3) the combined expansion of existing schools and the creation of new ones.

Increasing the capacity of existing medical schools would be least costly in terms of capital expenditures and operating costs. Medical schools now functioning have indicated that if funds were available for the necessary construction, it would be possible for them to increase their enrollment by approximately 1,000 students.

Increasing enrollment through this method has the additional advantage of being capable of attainment in a reasonably short period of time. It can be hoped that this approach will satisfy largely the increased needs of the most immediate future. Care must be exercised that medical schools not be induced to expand beyond their capacity to maintain the proportionately increased teaching staff necessary to preserve high standards of education and research.

Because of a justifiable concern with long range financing, several schools were hesitant to indicate the possibility of more than a very modest expansion.

There is a general agreement that the total predicted need for additional graduates cannot be met through adjustments in enrollment of present schools. New medical schools will have to be developed even though existing schools expand. It appears likely that at least ten new schools with an average graduating class of 100 students will be required. At the moment it does not appear urgent that a firm decision be made as to the total number of new institutions that must be established. It is clear that planning for the construction of five additional institutions could be implemented in the very near

future without any concern that this number would saturate the need. No parent university will undertake the large expense of a medical school development unless it is convinced that it is necessary. Because of the considerable period required for the study and planning of a medical school's establishment, there will be ample opportunity to re-evaluate future needs so there should be no concern that there will be any overdevelopment.

The present and urgent concern is that there is little secure evidence that the most conservative estimates of medical manpower requirements of the immediate future will be met.

Three questions immediately arise: is the physician/population ratio a useful index of need? Are Maryland's needs being met, and will they be met during the next 14 years? What is Maryland's responsibility to meet the nation's physician needs?

Physician/Population Ratios as an Index of Need

In 1959 there were 232,679 physicians (M.D. and D.O.) serving a civilian population of 174,409,000. (The number of physicians excludes those in federal service.) This represented a ratio of 133 physicians per every 100,000 people.

The use of existing physician/population ratios as a national index of need was explored by the Council on Medical Education and Hospitals when, at the 54th Congress on Medical Education and Licensure, it

> . . . brought together thoughtful leaders of higher education, business and industry, labor, agriculture, insurance, sociology, political science as well as medical practice and medical education. These representatives of large consumer groups and purveyers and producers of medical education considered together the challenges and future needs in medical service and education. Certain of the opinions generally supported by one of the representative groups at that Congress were:
>
> 1. The demand for medical service has been approximately in equilibrium with the supply.
>
> 2. The physician/population ratio, although not ideal, does constitute the best measure for planning the future medical care which can be brought to bear on the problem at the present time.

3. Since the level of medical care provided by the existing ratio is reasonably satisfactory, until there is a better measure of future needs, it would be prudent to pursue that ratio in planning for the production of physicians over the next several years.

4. Under no circumstances should any course of action be adopted which would cause a deterioration in the quality of medical education.

The physician-population ratio has remained relatively constant throughout the past forty years. During this same period, there have occurred sweeping changes of social, economic and scientific natures which have exercised important influences on the quality and quantity of physicians' services. Some of these changes have assisted in spreading a physician's services over a wider segment of the population; others have tended to restrict the populace served by the physician. Morbidity and mortality data for this four decade period support the contention that the spreading and restricting factors have balanced one another to a reasonable degree. This has allowed the level of medical care to advance grossly, though perhaps not ideally, with advances in medical science.

Therefore, it appears that the best available knowledge for projecting future medical manpower needs is on the basis of the existing physician-population ratio. In utilizing this base, its defects should be acknowledged so that projected figures are recognized as estimated and not endowed with a finiteness which they do not possess.*

We find no reason to question the usefulness of physician/population ratios as an index of national need.

The use of physician/population ratios as an index for projecting a state's need, however, is most certainly open to question. The health of a state depends on many factors—supply of physicians, population characteristics (age, race, education), type of economy (industrial or rural), wealth, the tempo of life, climate, etc. A favorable or unfavorable *ratio* of physicians by itself seems to have no *deciding* factor, as illustrated by the mortality rate: Massachusetts, New York, and the District of Columbia have very high physician/population ratios, yet their mortality rates are much

* JAMA, Vol. 171 (Nov. 14, 1959), pp. 1508-1509.

higher than the average rate for the nation; Idaho, North Carolina, and North Dakota have extremely low ratios of physicians to population, and yet they also have well below average death rates. (See Appendix II)

Another factor which affects the soundness of state-wide use of physician/population ratios is that many states have population centers adjacent to large cities in other political jurisdictions. For example, both Virginia and Maryland have heavy population concentrations around Washington, D. C. Maryland has a higher than average physician/population ratio; Virginia has a ratio well below the national average. Both states draw heavily upon the physicians in Washington, a city which has, excluding federally employed physicians, the highest ratio in the nation. Maryland's favorable ratio is even more comfortable when one considers the likely extent to which it relies upon Washington physicians for care. Virginia's ratio is improved—but to what extent we have no way of knowing; for all we know Virginia's ratio may be up to the national average.

If physician/population ratios are a doubtful index as to need in a given state, what would be a valid or useful index?

Within a state there is no single index as to need. There are, instead, indices. One must determine the need for additional physicians in a given state on an empirical basis: one must weigh a variety of health indices to ascertain whether or not the health needs of the population are being met. If the needs are not being met (as determined by such data as morbidity and mortality rates, as well as by informed judgments), one must project the steps necessary to meet those needs. Sometimes a new program is necessary. Sometimes technicians or nurses are the key personnel factors. Sometimes a physician shortage exists in a given specialty. Sometimes it may be a gross shortage of physicians. The point is that for a state to determine its current need for physicians, it must weigh a variety of factors. About the only time that physician/population ratios will have any validity in a state would be both where the ratio is above the national ratio and there are no population centers outside the state drawing upon the state's physicians. Maryland, significantly, is such a case: the national ratio was 133; Maryland's ratio was 136; no population center from outside draws upon Maryland physicians; Maryland people do draw heavily upon Washington physicians. This is suggestive that our needs are probably being met so far as numbers of physicians are concerned. But,

this is only suggestive; only by weighing a variety of indices can this be demonstrated.

Since no single index exists for determining a state's current needs, one might well question whether the future needs of a state can be calculated at all. Current needs can be ascertained, as we have suggested, by balancing a number of variables. The usefulness, however, of projections from these variables, particularly in light of our highly mobile population and changing economic patterns, is open to question.

The dilemmas posed by any attempt to project future needs in a given state, based upon all the variables, are wiped out once one removes the blinders created by state lines. When one recognizes that we are all part of one nation, and that medical education is essentially a national problem, not a state problem, then a single index of need is practicable. The index, of course, is the accepted physician/population ratio projected to determine the *national* need for physicians. If we meet the national need in terms of quantity of physicians, then by proper distribution we can meet population needs in all areas of the nation.

The necessity for the national perspective is forced by six factors.

First, about one half of the medical schools in the nation are private schools, with no commitments to meet local or state needs for physicians; their programs are generally not hampered by state lines and residency requirements. Their graduates meet national, as well as state needs. But essentially these private schools, as national schools, force us to consider the national problem of supply, for no state can really calculate its needs without taking into account what the private schools can and will turn out.

Second, schools with a high percentage of state residents do not achieve the objective of keeping them in the state. One study of the University of Maryland medical school graduates reveals that only 36% ended up in the State despite the fact that 75% or 80% of those graduating were originally Maryland residents.

The third factor which forces a national perspective is the simple fact that some states cannot support a medical school clinically or economically. The former is especially significant. To educate a physician *of quality* requires extensive clinical resources—it requires a wide variety of patients of all ages and with all types of

diseases. Some areas simply cannot provide this; their populations are too homogeneous, or too small, to provide the wide range of cases necessary for a good medical school. Who will train the physicians they need? This is a national obligation of the schools in other states.

Fourth, the armed forces require a certain number of physicians, as do the Veterans Administration and the Department of Health, Education, and Welfare. Federal needs must be met by the existing schools. In a sense this might be viewed as a return to the federal government for its investment through research and construction grants.

A fifth factor is that few states can calculate the full effect of population shifts. Maryland's population, we expect, will increase to 1975 at a greater rate than the nation as a whole. We shall experience a substantial in-migration of people from other states. Is Maryland responsible now for planning to meet the needs of those people? Or is it also the responsibility of the states from which the people come? We do not believe that Maryland should assume the full burden of in-migration. This further confirms the position that the problem of physician supply can be viewed only from a national viewpoint.

The anticipated population shifts also suggest a sixth factor. Medical schools cannot expand and contract with population movements. The costly investment in physical plants requires a stable approach to the use of medical school facilities.

These factors, we believe, make it essential that we relate ourselves to the national need, and not try to focus only upon the state's need. They suggest that all medical schools, even those which are operated by state governments, are national resources. If the national supply is met, then by proper distribution each state's needs can be met.

It will be pointed out, of course, that supply and distribution are not separate, unrelated entities. This is true. Therefore, in meeting "supply" we should build into the system sensible distribution factors. For example, three factors largely determine where a physician will practice: original residence, place of internship, and place of residency training. (The relative importance of the last two factors is increasing.) Considering these three factors, several distribution elements suggest themselves so that as we meet national needs in our schools, we also meet our own state needs.

First, Maryland must develop enough students who are qualified for medical training, and who want to go in for it. At the present time Maryland is just a shade below the national average: in 1959-60 we had 4.5 students per 100,000 of our population accepted; the national average was 4.7. A study made of the students entering all medical schools in 1958-59 showed that 17 states had a higher ratio of applications to medical school, and 14 of these states also had higher ratios of acceptance. This tends to confirm what our reasoning could readily develop—that if a greater number of qualified students apply to medical school, a greater number will be accepted. Since state of origin is a factor in getting physicians, then we must encourage more qualified students to apply to medical schools in Maryland and elsewhere. What is important is that they get into a medical school; it is not so essential, as we shall see, that they matriculate in this State.

Second, if Maryland maintains its present outstanding graduate medical education programs, medical graduates will flock here for their internship and residency. As studies show, there is an increasing tendency for medical graduates to settle in the state in which their internship and residency are taken. This, therefore, is another building of distribution into supply.

Some states have sought to build distribution factors into their programs by strict residency requirements at their state medical school. They require a high percentage of acceptance of their residents, and in some instances 100% state enrollment. These rigid requirements simply mean that less than qualified students matriculate during some years because not enough of the state's residents of top quality apply for admission. From the viewpoint of maintaining medical quality, this is undesirable. But more significant, residency requirements do not serve their intended purpose: the University of Maryland does not have residency requirements, though about 75% of its students are Maryland residents; a survey of the physicians in April 1950 showed that only 36.4% of University of Maryland's living graduates were resident in Maryland.* However, Maryland has contributed more than 36.5%, just as The Johns Hopkins has contributed to Maryland's needs more than the 20% of its graduates who are resident here. Maryland's and Hopkins' added contribution come from the doctors from other medical schools who went to Maryland or Hopkins for internship or resi-

* *Distribution of Medical School Alumni in the United States as of April 1950,* Bulletin 101, American Medical Association, 1956.

dency and who stayed to practice in Maryland. While no figures are available indicating the extent to which this has occurred, it is believed to be substantial.

These, then, are some of the distribution factors which if properly used will assure Maryland its fair share of the national physician supply. There are other factors, of course, such as good schools and universities, cultural activities, and generally the things that make any area a good place in which to live. These must always be the concern of the state.

Maryland's Need for Physicians in 1961

Maryland's overall need for physicians is currently being met.

The relatively large supply of physicians available to treat Marylanders suggests, as we have indicated, that we have enough doctors in this State at the present time. This suggestion is confirmed by a number of indices:

1. Our mortality rate per hundred thousand population is lower than the national rate, despite the fact that Maryland is experiencing an unusually large in-migration of people from the lower economic areas of the country. Maryland's death rate is 915.8 per 100,000 population; the nation as a whole has a rate of 951.3.
2. Maryland has 2 medical schools which have intimately related themselves to the community. Their clinics and their educational programs have had, we believe, a salutary effect upon the health of the population.
3. Maryland has strong local public health programs in each political subdivision, and a broad series of treatment programs to care for the indigent and medical indigent.
4. Maryland has a strong tradition of critical self-analysis with the concommitant desire to improve the services it provides to people.

In light of such indices, it is our considered judgment that Maryland's overall need for physicians is adequate for the present. We do have, however, certain distribution problems—not enough psychiatrists and physiatrists, and general practitioners in some of the more remote areas of the State. But we're speaking here of perhaps 60 or 100 doctors. Better distribution and use of what we

have can probably take up such slack.* These shortages, however, are not crises; no one needs to go without care even now.

It has, of course, been argued that we have a severe shortage, as indicated by the internships and residencies which are not filled. The frequency of this argument is sufficient that it requires an answer.

Medical schools do not exist, and should not exist, to supply hospitals with interns and residents. The internship and residency are actually educational programs with the provision of service to patients an incidental, albeit essential, part of them. This has often been lost sight of by some hospitals and certainly by those who claim we need more doctors because internships and residencies are not filled. The doctor, upon graduation from medical school, is simply not equipped to go into practice. He needs additional training, and this the internship and residency provide. Where does he look for such training? Generally to the larger hospitals with greatest preference for municipal indigent hospitals, university hospitals, and those larger non-affiliated hospitals with long established and well known graduate education programs. Other hospitals, those that do not get their desired number of interns and residents, simply do not have the type program which will provide the depth of training which the new graduate desires. Generally, such hospitals cannot provide such training because they do not have the clinical resources to make the internship and residency desirable to the new graduate, or the teachers at such hospitals—while well qualified—are unable to devote the requisite amount of time to teaching due to the press of other duties. These hospitals generally secure the greater number of foreign graduates who come here primarily for educational training. When the hospital program cannot provide the fullest possible training, a disservice is rendered to the intern and resident and, in turn, to the people of the nation which sent them here for additional knowledge.

The "shortage" which exists is primarily a shortage of house staff to provide medical service coverage which the attending physician would render when no house staff is present, such as the taking of case histories, dressing changes, and the like. This service is not the proper primary function of the intern or resident. Provision of this service can be made by the part time or full time employment of physicians, or by absorption of these duties by the attending

* See Chapter Six.

physician, without any marked adverse effect upon the supply of physicians.

Finally, we need to consider the question of physician supply in light of the relatively poor health status of the Negro citizen. When one analyzes racially our state-wide mortality rate in the light of age distribution (percentagewise there are not nearly as many Negro elder citizens as there are whites) we find that the Negro death rate is disturbingly high. Also high for the Negro population are such sensitive indices as neonatal and perinatal death rates, and disturbingly low for the Negro population in some counties are the per cent of deliveries in hospitals and the per cent of deliveries with a physician in attendance.

A review of these indices (they are found in Appendix II, and merit rather careful study by all who are interested in the public's health) would perhaps suggest at first that we need more doctors. However, a number of other factors need to be considered in this regard, and in sum they indicate that the problem is not one of a gross physician shortage:

1. Public knowledge as to available health services, and as to their importance in maintenance of health, is seriously deficient. Available programs and services mean nothing unless people know about them, are convinced as to their need for them, and use them. (It is not uncommon, for example, for some women in the lower socio-economic groups to appear at a hospital in labor without any record of pre-natal care.) The failure of some to avail themselves of existing services, and their consequent poor health status, can to a great extent be corrected through augmented health education programs by local health and school departments.

2. There is a gross shortage of hospital beds for Negro patients. Only token admissions are permitted in many hospitals, thus forcing people either to abandon hope of needed hospital care or to enter the city hospitals which do not restrict admissions racially. In Baltimore City in 1959, for example, 11,711 Negro births (all but 70 of the total Negro births) were delivered in 7 of 17 hospitals; The Hospital Council's 1958 report stated that "a survey of the 17 Baltimore hospitals in September 1957 showed that 7 offered private and/or semi-private accommodations to Negroes, of

limited number in some of the seven." * These hospitals in turn become overcrowded, forcing many types of cases to be discharged too early, with greater risk of an adverse effect upon health. Maternity cases are a case in point: it is not uncommon to find mothers discharged within 24 hours of delivery; indeed it has been reported to the staff of the State Health Department by ambulance drivers that it is not uncommon for the delivery to be made in the accident room of some hospitals while the ambulance and driver wait to transport the mother and infant back home. The severity of this problem in some counties is in part attested by the low percentage of Negro mothers delivered in the hospital, commonly below 80% and as low as 40.7%, and by the high neonatal and perinatal death rates.

3. The general economic condition of the Negro population is not conducive to good health. As better wages for the Negro become available it should facilitate provision of good diet, perhaps one of the most important preventive health measures. As improved housing opportunities become available, this too should help overcome many of the health problems which go with substandard housing and congestion. While this situation is a problem to all in the lower socio-economic group, it is particularly acute for the Negro.

These are some of the causes for the relatively poor health status of the Negro. The need for a special and more exhaustive study of Negro health (and of others in the lower socio-economic group) is indicated by the data contained in Appendix II and should be given priority by the State Board of Health and Mental Hygiene in partial fulfillment of its legally assigned function to "have care of the health interests of the people of this State."

Maryland's Responsibility to Meet the Nation's Physician Needs

We have argued that Maryland's needs can be met only as the nation's needs are met. We have argued that each medical school is a national resource. We have argued that Maryland's physician manpower needs are currently being met.

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* *General Hospital Facilities for the Baltimore Area,* The Hospital Council, January 1958, p. 70.

What is our responsibility for the future?

The United States will require at least 10,000 graduates per year (quite likely 11,000 per year) from medical schools by 1975 if it is to maintain the current ratio of physicians to population. This is about 3,000 more graduates per year than are currently being turned out. The increased need is based simply on population expansion. It assumes that the trend of physician immigration from abroad will continue to supplement the number of graduates from U.S. medical schools. If, however, we seek to replace the reliance upon foreign physicians (as we recommend) then the national need for 1975 is increased by some 1,400 to 1,600 for a total of 11,400-11,600 graduates per year.

Maryland's population will expand along with the national growth, and it is expected that Maryland's growth will be greater than the national average. The need for more physicians is therefore certain. How many more Maryland shall need, no one can really forecast. But if we do our part in meeting the national need, we can anticipate that our state needs will be met.

We therefore looked into several possible projections which we could safely recommend as a reasonable Maryland contribution.

We quickly discounted the projection based upon physician/population ratios. The ratio in itself is not reliable for a state, as we have pointed out.

We then determined the ratio of medical school graduates from Hopkins and Maryland to the 1959 state population with the thought that we might apply that ratio to the 1975 population. But since Maryland's population will rise more sharply than the national population due to anticipated in-migration, this projection assumed that Maryland would be responsible for a greater number of graduates than states whose populations are stabilized and which exported people to Maryland.

A third projection was made based on the ratio of graduates to licensed physicians. Nationally this ratio has remained relatively constant for the past 30 years—at about 30 graduates per 1,000 licensed physicians. Using the national ratio of 133.4 physicians per 100,000 population and Maryland's estimated 1975 population of 4.6 million, we calculated the number of physicians required in 1975. To the resulting figure we applied the standard of 30 graduates per 1,000 physicians. This projection, like the first, necessitated

reliance upon a doubtful index for state needs, although it did overcome our inability to calculate the length of time physicians stay in practice. Like the second projection, this one assumed that Maryland by itself is responsible for in-migrants over and above the national average population increase. What is especially disturbing about this is that with an in-migration of people, doctors can be presumed to be among those coming in. It can be further assumed that some of the in-migrants will be parents of medical students, who became medical students just before parental migration to Maryland.

With each of these projections there were aspects, as we have noted, which were disquieting. There were assumptions which were not altogether convincing. We therefore attempted a fourth projection which overcame many of the objectionable features of the other three. Its main virtue was that it assumed at the outset a national perspective.

Our fourth projection calculated the ratio of graduates from Maryland's two medical schools to the national population, and then applied that ratio to the projected national population for 1975. We used 1959 as the base year.

There were 151 medical graduates from the University of Maryland and The Johns Hopkins University in 1959 and the national population was 174,409,000. This provided a ratio of .866 doctors graduated in Maryland per 1,000,000 national population in 1959.

$$\left(\frac{151}{174{,}409{,}000} = \frac{X}{1{,}000{,}000} = .866\right)^{*}$$

Two projections for the 1975 population are 215,790,000 (based on pre-World War II birth rate) and 235,246,000 (based on current birth rate). The 1960 census showed that the Census Bureau's Series II projection was fairly reliable. Since the 235,246,000 estimate is Series II, we shall use that figure. Applying the above ratio of .866 we would require a total of 204 graduates in 1975. Allowing for attrition (due to academic failures, personal factors, diversion to other doctoral fields, etc.) we should plan to enroll in medical schools within Maryland by 1971, for 1975 graduation, 240 medical

* This ratio will vary with the population projection used. This projection is for the civilian population in 48 states only.

students. This is 22 more than are presently planned.* This assumes, however, that we will continue to receive a constant flow of foreign medical graduates.

Foreign Medical Graduate Immigration

Since we now rely heavily upon foreign medical graduates to maintain our national standard of 133 physicians per 100,000 population it would seem appropriate to examine the desirability of such dependence.

Several points should be considered in this regard.

First, most interns and residents, who are graduates of foreign medical schools, come to this country on student visas. Since citizenship, or declaration of intent, is required in most states in order to be licensed, these foreign medical graduates are generally not licensed and hence are not counted as physicians serving this nation's medical manpower needs. By and large, therefore, our projections are not affected by the presence of these interns and residents. It might be noted, parenthetically, that as our graduate education programs continue to develop in excellence, more and more foreign graduates will want to come here on student visas to learn. The Institute of International Education poignantly makes this point in its publication *Open Doors 1960:*

> During the academic year 1959-1960, 9,467 foreign physicians from 92 countries were training in hospitals throughout the United States; 6,912 trained as resident physicians and 2,545 as interns. These figures represent a 13% increase over the 8,392 physicians reported last year and almost double the number reported in the first IIE survey of foreign physicians in 1954-1955. In that year, 5,036 foreign physicians were with United States hospitals.**

Second, some of the foreign graduates who are here as interns and residents want, after a while, to stay on permanently. In such instances they must leave the country and enter as immigrants

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* This allowance for attrition is a little above Maryland's experience for 1959. The deans of both medical schools and of the School of Hygiene and Public Health agreed that it would be well to allow a safety factor for several reasons: 1) attrition fluctuates from year to year but has in general been rising nationally, 2) a greater number of medical students are beginning to divert to other doctoral fields, 3) attrition will be affected by the quality of students matriculating and by the rising costs of medical education.

** Quoted in JAMA, Vol. 174, No. 11 (Nov. 12, 1960), p. 1455.

under the normal quota systems. Joined by other physicians from abroad under immigrant visas they represent, when licensed, additions to the medical profession in the United States. The United States, we must remember, is still to some extent being settled for the very same reasons that brought people to these shores during the 17th, 18th, and 19th centuries. Some of today's settlers are physicians, particularly from areas which have had economic and/or political upheavals during and following the second World War. Some of the foreign medical graduates, however, are citizens of the United States (366 out of 1,626 in 1959) who for various reasons studied abroad.

Third, it should be noted that while a much smaller number of American trained physicians have gone abroad to work as compared to foreign physicians coming here, an increasing number will be going abroad in the next decade on full and part time bases. The extent of the latter is growing but is not always recognized in calculations regarding our medical manpower contributions abroad. Increasingly, medical schools are cooperating with universities and governments abroad, and as part of their efforts send teams of physicians over for periods of 2, 3, 6, and 12 months. It should be noted that both the University of Maryland and The Johns Hopkins University are very active in such endeavors.

Our intake of foreign physicians is a matter for concern as evidenced by the extent to which we have come to rely upon them to maintain our national standard. See Table 1.

Table 1

PHYSICIANS LICENSED IN THE U. S. FOR THE FIRST TIME THUS REPRESENTING ADDITIONS TO THE MEDICAL PROFESSION

Year	Licensed (Incl. Foreign Medical Graduates)	Foreign Medical Graduates Licensed	Ratio of Foreign Medical Graduates Licensed to Total Licensed
1950	6,002	308	1:19.5
1951	6,273	450	1:13.9
1952	6,885	569	1:12.1
1953	7,276	685	1:10.7
1954	7,917	772	1:10.3
1955	7,737	907	1: 8.5
1956	7,463	852	1: 8.8
1957	7,455	1,014	1: 7.3
1958	7,809	1,166	1: 6.7
1959	8,269	1,626	1: 5.1
1960	8,030	1,419	1: 5.7

Source: JAMA, Vol 176, No. 28 (May 27, 1961), pp. 711 and 730.

Whether this trend of foreign physician immigration will continue is a moot point, for historically we can see that the trend is of very recent origin.

For many reasons it would seem that the advantages offered by our country will encourage the continued high immigration of foreign physicians. The advocates of this position point to our favorable land mass, potential for population growth, economy, political system, and standard of living. This is all very true but the position assumes three things which are open to question:

1. That the nations abroad will continue to finance their medical schools to train doctors for the more affluent nations.
2. That the political, economic, and cultural leadership of the United States and/or the nation in question will fail to make the homeland sufficiently attractive to its medical graduates to discourage emigration.
3. That foreign governments will permit the continued emigration of physicians who are sorely needed by their own people.

We have purposely selected 21 countries to illustrate our concern. Each has sent to the United States a notable number of physicians, some of whom were American citizens who attended medical schools abroad.* Each has experienced recent political or economic upheaval. Many are underdeveloped nations whose populations are emerging and seeking to attain the worthwhile benefits of western civilization. The countries are listed in Table 2.

There is evidence to suggest that this source of medical manpower will not continue to benefit the United States:

1. We have been advised that both India and Iran are very much concerned over the emigration of their medical graduates to the United States. Some leaders in those nations have considered a cutoff on such emigration, a ban which might include even those who wish to study abroad. What happens if a large number of countries band together and

* Of the 1,626 foreign trained physicians licensed in 1959, 366 were American citizens. Most of these were probably graduates of continental European schools. Exact data are not available, but one knowledgeable authority has stated that a rather significant number got their training in southern Europe, particularly Italy. (Italian medical school graduates licensed here in 1959 who were either immigrants to this country or United States citizens numbered 234.) This observer was also under the impression that only a relatively small number of the American foreign graduates were from English schools.

prevent further emigration? Certainly some of these nations can ill afford to impoverish their countries by continued emigration such as occurred in 1959 and 1960.

2. Many of the foreign physicians are political refugees. One can anticipate that this immigration will taper off. The bulk of those who could not reconcile themselves to the new regimes of the late forties and early fifties have in all probability left. Some are now licensed; some will be licensed as they complete internships, residencies and citizenship requirements; some may still be waiting to get in.

3. Much of the English immigration stems from the institution of the government health program. In its beginning the government was forced to draw upon the younger physicians for key posts. Use of these young men did not permit the normal turnover due to retirements. Hence many English doctors found opportunities for advancement severely limited. Within another 10 or 12 years, as retirements begin to occur, this problem will be correcting itself, and the motivation to emigrate will be lessened.

Table 2

	Number Licensed in the United States	
	1959	*1960*
Argentina	21	28
Bolivia	2	4
China	37	40
Colombia	12	8
Cuba	93	77
Czechoslovakia	21	13
Ecuador	10	5
Egypt	15	29
England	87	95
Germany	225	199
Hungary	78	95
India	13	18
Iran	20	32
Korea	11	28
Lebanon	28	36
Mexico	90	94
Peru	4	16
Philippines	52	73
Poland	20	22
Rumania	5	12
Turkey	28	28
Total	872	952

Source: JAMA, Vol. 173, No. 4 (May 28, 1960), p. 410ff
Vol. 176, No. 8 (May 27, 1961), p. 720ff

We would in no way suggest that immigration should be stopped. On the other hand, we do not believe it is in the best interests of our nation to be so dependent upon foreign medical graduates.

We should aspire to maintain the present physician/population ratio from domestic sources. Any other course places us in a highly vulnerable position should the foreign situation change, as well it might. Any other position could create havoc in the event of national emergency. Any other position does not enable us to make our greatest possible national effort in world leadership.

Therefore, as a nation, we should be graduating more doctors *now* in order to be self-reliant and to maintain our standards. Any foreign physician intake above our domestic turnout can be viewed as a *plus* factor which could be used advantageously, for despite anticipated medical advances and more efficient modes of practice, the demand for medical services and the use of medical facilities will rise generally as our population ages, as health insurance becomes more comprehensive and more available, and as our economy advances.

In 1959, our medical schools graduated 6,860 physicians. That same year 1,626 foreign physicians were licensed for the first time. We have been advised that we required those physicians to maintain our national standards. We should have graduated, therefore, 6,860 plus 1,626. Since Maryland's two medical schools graduated one physician for every 45.4 of the 6,860 graduated (6,860 ÷ 151), Maryland's schools should be responsible for the same ratio of the 1,626. To replace the foreign graduates by domestic supply in 1959, therefore, Maryland's two medical schools, between them, should have graduated 1/45.4 of the 1,626, or an additional 36.* We should increase our training capacity by this number as quickly as possible. This expansion is apart from the projected need for 204 graduates recommended earlier in this chapter.

Required Expansion of Medical Education Capacity

Immediate expansion by 36 graduates is essential if we are to avoid dependence upon foreign trained physicians. In addition, Maryland schools should plan to graduate 204 graduates per year by

* If, on the other hand, we accept as reasonable and proper the immigration in 1959 of enough doctors to care for the 103,931 immigrants (who would require about 138 physicians) then Maryland should be responsible for only 1/45.4 of 1,488 (1,626—138) or, 33 additional physicians.

1975 to fulfill our national responsibility to graduate the same ratio as were graduated in 1959. This means a total educational capacity of 240 graduate physicians per year by 1975. Allowing for attrition we will therefore require by 1971 (for 1975 graduation) approximately 282 first year openings. This amounts to 64 more than are planned by the two medical schools (282−218=64). There are four principal ways by which this expansion can be met:

1. Expansion of the present schools by 64 first year students over and above the expansions already planned
2. Develop a school of basic medical sciences
3. Combination of *1* and *2*
4. Develop a third medical school.

CHAPTER THREE

SCHOOLS OF MEDICINE AND BASIC MEDICAL SCIENCES

Conclusions and Recommendations

Conclusions

1. Schools of basic medical sciences provide an effective means by which to increase the number of physicians graduated from the 4-year medical schools. This method is relatively inexpensive since it permits development of the full potential of the 4-year medical school, making it thereby more efficient; it does not encourage needless duplication of facilities and personnel.

2. Schools of basic medical sciences should be part of a university. No university exists in Maryland, apart from the University of Maryland and The Johns Hopkins University, which can serve immediately as the base for such a 2-year school. Since these universities already have medical schools and unmet needs, it does not seem practicable to consider them as a base for a 2-year school in the foreseeable future. To secure a school of basic medical sciences, therefore, one of the colleges in Maryland would have to expand and become, in effect, a university.

3. Maryland has vast clinical resources which could be used for medical education purposes. Some of these resources are untapped, some are not fully utilized.

4. Since a strong university base is considered highly desirable for a medical school, no new medical school would be practicable in the Maryland area at this time with the possible exceptions of the complex of Catholic hospitals in Baltimore working with Catholic University, and of the University of Delaware in conjunction with the clinical resources in Wilmington. As suitable graduate programs develop at other Maryland colleges, a third medical school would be feasible.

Recommendations

1. The planned expansions at The Johns Hopkins and University of Maryland schools of medicine should be given full and prompt support by the Maryland state government as this

state's contribution to the present national need for physicians.

2. The trustees of both universities should direct that a study of the medical school programs be made to see if the schools, between them, cannot by 1971 further absorb 22 students in their entering classes. This would assure fulfillment of our minimal national obligation to graduate by 1975 the same ratio of physicians as we graduated in 1959. This re-study should consider the need for physical plant expansion to accommodate the required added admissions. Since the graduate goals are a state obligation, state government should be prepared to support any required expansions financially. This study should be given priority by the trustees, since planning efforts by other bodies will depend upon their findings.

3. Schools of basic medical sciences are needed nationally. The feasibility of meeting future needs by such a school in Maryland, with a class size of at least 42 students, should be determined at once. Since our two medical schools will be able to take additional students in the third year, regardless of whether they enlarge their entering classes, a 2-year school would thus provide for maximal development of our medical schools and for greater effort in meeting national and international needs, while at the same time helping to overcome the dangerous dependence upon foreign trained physicians. A 2-year school would allow for the education of more Ph.D.'s in the basic medical sciences, doctorates now in short supply. A 2-year school would provide the basic framework for development of a 4-year school should the present medical schools be unable to expand sufficiently or should the need otherwise arise. The State of Maryland should be prepared to grant substantial financial assistance in the development of this school.

Since the structuring of a medical curriculum is involved, since medical school affiliation is highly desirable, and since appropriate clinical affiliations are mandatory, the Committee on Medical Care should appoint a select subcommittee of medical educators to ascertain which college campuses in Maryland would be most appropriate for the needed school of basic medical sciences and the mechanism by which it might be achieved. The subcommittee should have at its disposal the

report of the Hopkins and Maryland trustees indicating the extent to which those medical schools might expand.

Schools of Medicine and Basic Medical Sciences—Discussion

Introduction

The curriculum in most 4-year medical schools (there are 83 in the United States) falls generally into two parts—the pre-clinical or basic science phase, and the clinical phase. During the former period, which are the first two years, the fundamental basic sciences are taught primarily—such as anatomy, physiology, biochemistry, microbiology, pathology, etc. These studies form the scientific base upon which the clinical studies are taught, mostly during the last two years. The clinical courses include such subjects as medicine, surgery, pediatrics, obstetrics-gynecology, psychiatry, etc.

This division of the curriculum permits the development of 2-year medical schools (there are presently 3 in operation and several more being planned). Actually a 2-year medical school is a school of basic medical sciences with a curriculum which is comparable to the curriculum in the first two years of a four-year medical school. As a result of this compatibility it is possible for students from a two-year school to complete their medical education by transferring to the third year class in a four-year school. The four-year school is able to absorb additional students because of vacancies created by those dropping out of school in the first two years, and also because it is relatively easy to expand the clinical years without a corresponding expansion of physical plant.

Basic Medical Science Schools

The Bane report * recommended the creation of two year schools of basic medical sciences. Its discussion was as follows:

> At the close of World War II there were eight schools which offered only the first 2 years of medical education. Upon completion of these programs the graduates transferred to other schools for the clinical years. Today four of these schools have built clinical facilities and expanded their programs to cover the full 4-year program, and a fifth is in the process of so doing. With the decline in the number of basic science

* Op. cit., p. 53.

schools and the normal attrition in the first 2 years of the 4-year schools, today's 4-year schools find that they have an estimated 700 to 800 vacancies in the third year. Thus the graduates of eight or more new schools of the basic sciences could be placed in the clinical programs of existing 4-year schools.

The Association of American Medical Colleges and the Council on Medical Education and Hospitals of the American Medical Association are encouraging universities to establish such programs. Such a development might provide up to 800 first-year places.

For the institution that is considering the desirability and feasibility of adding medical education, beginning with the development of a basic medical science program may offer a number of advantages. Among them:

(1) A 2-year program within the framework of existing liberal arts and graduate programs can offer an opportunity to strengthen and enrich university graduate offerings in the biological and physical sciences.

(2) The 2-year program involves very much less expense than the 4-year program.

(3) The program could be planned and commence operation at an earlier date than could a full 4-year program.

(4) The program would make it possible for an added number of young people to undertake the study of medicine, and thus for a state to increase the educational opportunity for its citizens.

(5) The present number of openings in the clinical years of 4-year schools assures the placement of qualified upperclass students from additional 2-year schools, particularly if institutional planning to this end is undertaken.

(6) Once a 2-year program is well-established, it is possible to add the clinical program when needed. This has been the case with six schools in the past 20 years.

Much of the current experimentation with curriculum and teaching is directed towards the integration of the teaching of the classic basic medical sciences and the clinical subjects.

Bringing into the 2-year curriculum the necessary aspects of clinical medicine is a real problem. The separation of the first and second halves of the medical course presents difficulties, but it should be possible to overcome these difficulties with careful planning and with the development of cooperative programs with 4-year schools.

The 2-year medical school has not met with universal approval in academic circles, as suggested by Dr. William R. Willard's article, *New Medical Schools: Some Preliminary Considerations,* appearing in the February 1960 issue of The Journal of Medical Education:

> Another less attractive but possible alternative is to establish a new two-year school. There are several existing medical schools, especially those located in metropolitan areas, with access to a large amount of clinical material, which can handle more students in the third and fourth years than they can enroll in the first two years owing to limited facilities in the basic sciences. Furthermore, most medical schools have an attrition rate of about ten per cent in the first two years. The creation of good two-year schools whose students would transfer to those medical schools which can accommodate more students in the third and fourth years may be the cheapest way of initiating education of more physicians, although there is no unanimity of opinion that the two-year school either has been or can be an effective permanent solution to today's problems in medical education.
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> Nevertheless, since seven of the ten two-year schools which existed in the United States prior to 1940 have been converted to four-year schools, it can be anticipated that a new two-year school may eventually be converted to a four-year school. A two-year school will require access to clinical material to provide students with a proper clinical orientation for their basic science instruction and the opportunity to learn physical and laboratory diagnosis. However, the requirements for clinical material are modest and usually can be satisfied by affiliations with existing local hospitals. If possible, the program should be arranged to integrate with the programs of those schools to which students will transfer.
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> The two-year school has inherent limitations. Leading medical educators are usually interested in developing an integrated four-year program, and the probability of recruiting

an outstanding dean and faculty for a two-year school is much less than it is for a four-year school. Furthermore, the impact of a two-year school upon the quality of medical care in the immediate locality and in its region is likely to be considerably less than that of a four-year school. However, the economics involved in establishing and maintaining a new four-year school are such that the two-year approach may be the only one practical in some areas. Although a two-year school is cheaper than a four-year school, there is a danger that the financial requirements of a two-year school will be underestimated, with a concomitant sacrifice in quality.

This article prompted a sharp rejoinder from Dr. S. Marsh Tenney, Dean of the Dartmouth Medical School.* Dr. Tenney's discussion is sufficiently noteworthy to reproduce in its entirety:

Letter to the Editor

I have just read with great interest the recent article in *The Journal of Medical Education* on "New Medical Schools: Some Preliminary Considerations," by William R. Willard, but I confess to keen disappointment over the superficial and biased analysis of the three paragraphs concerning the 2-year school problem on pp. 98-99. The opinions are very clear, but how they were arrived at is not. To cite the alternative of establishing a 2-year school as "less attractive" reflects a judgment which, I take it, is more emotional than objectively analytical. The obvious rejoinder is, "less attractive" to whom? No doubt, the 2-year, or basic science, medical school in the United States occupies a position in the pattern of medical education which in the eyes of many educators is controversial. The historical trend would seem to imply that a 2-year medical school must face one of two alternatives. It can either disappear entirely from the scene, or "graduate" into a 4-year medical school. The fact that in most instances the 2-year schools were "demoted" from 4-year schools at the time of the Flexner report because of inadequate clinical facilities suggests that the first alternative is simply the final step in an historical trend. On the other hand, the expansion into a 4-year program, of itself, is sufficiently adequate in many peoples' eyes to define respectability. This persistently negative attitude has been an important deterrent

* The Journal of Medical Education, Vol. 35, No. 6, pp. 553-57, June 1960.

to an objective evaluation of the possibly significant role that 2-year medical schools can play in fulfilling a national need. A number of developments in the relatively recent past suggest that a re-examination of the potential role of the 2-year medical school is both warranted and timely.

Both the problems and the opportunities that beset a 2-year medical school are in no essential way different from those of the 4-year school. There are, of course, significant differences among the various elements that constitute the total responsibility of an institution when the two types of school are compared, but these differences are more of degree than of fact.

For the sake of clarity in what follows I shall assume that a 2-year medical school has meaning only if it is closely affiliated with and located on a university campus; and, similarly, it must be closely affiliated with a teaching hospital, whose staff is the part-time clinical faculty of the medical school. This system has a striking similarity to the medical schools at Oxford and Cambridge. The only requisite that differs fundamentally from that of 4-year medical schools is in the requirement that the faculty of medicine be located on a university campus—apparently not an essential consideration for many 4-year medical schools. The magnitude of the clinical facilities and faculty will clearly be less for the 2-year school than in the case of a 4-year school. Other aspects may be only trivially different from what is regarded by many schools as adequate for a full 4-year program.

Intellectual setting.—As the foundations of medicine have been more firmly defined its stature as a scientific discipline has increased. The majority of the great advances in medicine have resulted from close and deliberate association between the basic medical sciences and the clinical sciences. The results of this collaboration and contagiousness of spirit have produced investigative work and instruction in many clinical departments today that closely resemble those activities as they existed in a basic science department not so many years ago. On the other hand, in many cases the significant advances in basic medical science were the outgrowth of problems suggested from observations made at the bedside. The results of this affiliation have been so successful that one need have little concern for their continuation in the future. The so-called "integration"

of the curriculum and the trend in modern clinical investigation insure both the spiritual and intellectual tie between basic and clinical science.

The basic medical scientist has recently come into a more clearly defined relationship with the physical and natural sciences and with mathematics than ever before. This evolutionary trend has been neither sudden, nor in all cases is it fair to say that the basic medical scientist is not simply applying those principles of the mother sciences to living phenomena in medicine. The number of contact areas between the physical and life sciences is, however, increasing, and in many of the most significant frontier areas the medical and physical scientist appear to be working in parallel toward the solution of a problem which differs only in the system in which it presents itself. It is for this compelling reason that I assumed that a basic science medical school must be located on a university campus.

This posture of the basic medical sciences, intermediate between the physical and life sciences, and the clinical sciences, defines nothing unique with regard to a 2-year medical school. There is an element, real though intangible, that is of some special signficance and worthy of consideration. In the 4-year medical school the center of gravity is inevitably in the direction of the clinical departments. In the majority of instances they are numerically the largest, carry the largest budgets, and are the most influential in determining the policies of curriculum and institutional function. Without enumerating the very understandable reasons why this is usually so, or posing the irrelevant ethical issue of whether this is "good" or "bad," an institutional atmosphere is often created in which the basic medical sciences are "pre-clinical" and, from a student's viewpoint, are obstacles to be "got through" before qualifying for admission into the clinical years. If the basic medical sciences can exist on their own right, as they may in a 2-year medical school, their position as fundamental disciplines is more clearly established. Lest there be any misunderstanding, I am not implying that in a basic science medical school the student must be divorced from clinical contact—quite to the contrary. Clinical material must be presented during the first 2-years, related to the basic science disciplines, and those introductions to clinical medicine—for example, physical diagnosis and corre-

lation clinics—are as important as in any 4-year setting. The difference, then, is a subtle one. It is simply to create an atmosphere where the structure of the school is in the basic sciences, and where the relationship of these basic medical sciences is strong in the direction of both their mother sciences and the clinical sciences; but as to the direction of intensity of focus, there is no question. It is "backward" to physics and chemistry, biology and mathematics, and to psychology and sociology. In this setting the student and faculty are closely associated in a common mission, without diversion, and it is not unlikely that some students may find sufficient inspiration to elect a career in one of the basic science fields. Any device which will attract more students into careers as teachers and investigators in the basic medical sciences will surely be doing as great a service toward the solution of the medical manpower need as will the production of more practicing physicians.

Relationship to medical education needs.—Several recent reports have enumerated the ways in which the growing medical manpower need can be met. These have included the establishment of new 4-year medical schools, the enlargement of existing 4-year medical schools, and the creation of 2-year medical schools. It is with regard to the last possibility that we are solely concerned. Nonetheless, the second and third alternatives are intimately linked. It is variously estimated that at the present time there are available in the third and fourth year classes of all the 4-year medical schools throughout the United States some 500-600 vacancies. This is not due solely to the attrition rate during the first 2 years, but reflects as well a relatively recent trend in medical school-affiliated hospitals, particularly in the urban centers. As the number of affiliated hospitals has increased, and concomitantly the clinical faculty of the medical schools has increased, there has been created a potential for a student body in the third and fourth years larger than can be filled by the institution's existing facilities during the first 2 years. In general, the 4-year medical schools are reluctant to expand their facilities or indeed to cope with the larger class sizes in subjects such as biochemistry, anatomy, and physiology, while, on the other hand, a larger number can be accommodated, without compromise of educational quality, in the clinical years, with little or no additional cost to the school. It is clearly apparent how well-

conceived 2-year medical schools can contribute to the medical manpower output by simply acknowledging a potential that already exists.

The economics of the establishment of the new 2-year medical school are no less confusing than that of establishing a new 4-year medical school. Experience alone will provide the answer, but it is certainly established that 2-year schools are less expensive than 4-year schools. It may, in fact, be only 1/4 to 1/3 as expensive as establishing a new 4-year medical school. If this impression is verified, the 2-year medical school provides a unique solution for increasing the number of physicians annually by 500 or 600 in the most economic way.

Relationships to 4-year medical schools.—One of the most serious inherent limitations in a 2-year medical school is its inability to construct a complete curriculum within the perspective of a program designed for 4 years. Assuming that the current trend which emphasizes the importance of daily reminders to the student, that the 4 years in medical school are an integral, coherent whole, will continue to gain favor, one possible solution is for the 2-year school to affiliate itself closely with a single 4-year school and design its curriculum to coincide with that institution to which its students will ultimately transfer. From a practical standpoint, it would seem unwise for an institution, independent and with separate charter, to link itself with another institution in such a dependent position. It would appear to take almost superhuman understanding for two such institutions in this locked position to function harmoniously. On the other hand, the assumption that the meticulously integrated 4-year curriculum is universally the most satisfactory form of higher education may prove to be erroneous. As greater emphasis is placed on independence in learning, plus opportunities for creative experience, and particularly as flexibility is introduced into the medical curriculum, the above problem may be less ominous. There are some even who feel an increasing concern over the rigidity of medical curricula. Effective opportunities, free time, in fact, any divergence from a tightly packed, well-ordered 4 years of life, have been traditionally denied medical students. That this in itself fosters immaturity and may indeed stifle originality and imagination in many students is not unlikely. Educators in general have forgotten

that academic freedom was originally established for students, not faculty.

Problems.—The fact that at the end of 2 years the students must transfer to another institution is at the heart of most of the major problems in a 2-year medical school. Reference has already been made as to how this may complicate the construction of a curriculum. Perhaps more important is the curious psychological setting which is created by the necessary dependence of the 2-year school on 4-year schools. This is to say, at least implicitly, there is less freedom in independent planning and execution of educational programs for, from a practical standpoint, success of the school will always be determined in some measure by its facility in transferring its students to other institutions for their M.D. degree. It is placed, then, in the awkward position of examining every decision of major importance in the context of its acceptability to those other institutions where the student may transfer. There is another problem which is often never mentioned. This is that a 2-year medical school has no graduates. The students pass on into another institution from which the degree is awarded and with whom they identify. The strength that accrues to an institution through its alumni body is partially compromised.

A problem which has been mentioned by others is that the impact of a 2-year school upon the quality of medical care in the immediate locality is considerably less with a 2-year school than with a 4-year school. This is unquestionably true, although, as in most of the discussions on these points, there is a dangerously insidious ease with which the generality of 2-year schools is compared and contrasted with the generality of 4-year schools. Whether or not this lessened impact, in itself, constitutes a serious handicap is a matter for judgment only after the definitions of the goals are made clear. In a medical center there is concern and responsibility for patient care, research, and education; and in different settings the balance and priority among these three elements will vary. Since most medical educators view medical schools largely from their own experience, and this is almost exclusively from the standpoint of a 4-year medical school, there is a dangerous tendency to examine a 2-year school with reference to the extent to which it is fulfilling the function of a 4-year medical school. Although a 2-year medical school will have less impact on patient care

aspects in any community, when individual examples are compared it may appear that some 2-year medical schools are more effective in this regard than are some 4-year medical schools, and this is only to say that the generalities may be deceiving. On the other hand, the kinds of research in the basic medical sciences, and the special perspective in which the basic medical sciences can be portrayed in a basic science medical school, may be considerably different than in the setting of many 4-year medical schools. From this it may be deduced that a basic science medical school will have a greater impact on the science departments of the university than will a 4-year medical school. I believe the important point is to emphasize that there are many ways of doing many things, and that the opportunities of the 2-year schools to stress research and education in the basic medical sciences, with particular emphasis on their relationships to the physical and life sciences, is an increasingly important obligation that should be assumed by some institutions in the total pattern of medical education in this country. The error in analysis arises when a judgment of "good" or "bad" is leveled at a 2-year school simply on the basis of the extent to which it measures up to a generalized conception of a 4-year medical school.

It has also been predicted that it will be more difficult to recruit an outstanding dean or a faculty for a 2-year medical school than it is for a 4-year medical school. It is not entirely obvious that this statement is valid. The only generalization that appears warranted is that all medical schools are having difficulty recruiting good deans and good medical faculties. It is unquestionably true that there will be individuals who will not be attracted in the 2-year school environment, and conversely, surprising as this may seem to those whose thought processes have been inalterably solidified by the 4-year medical school concept, there are those who are not attracted into the 4-year medical school environment. Given the resources, the opportunities for a productive life, and the proper setting, the 2-year school is at no greater disadvantage than the 4-year school. To some extent the faculty will look different from a 4-year school faculty, but then there may be some advantage in deviating from stereotypy.

S. M. Tenney, M.D.,
Dean, Dartmouth Medical School

Dartmouth, originally had a 4-year school, retrenched, and has now had its 2-year school for nearly 50 years. Current enrollment is 24 students in each class. The school is building new academic facilities and plans to enlarge each of the classes to 48. Dartmouth does not intend to develop into a 4-year school. Dr. Tenney reports in a personal communication:

> It is a fact that a number of our students do transfer to Harvard Medical School for their clinical years. Sometimes this has amounted to virtually the entire class and rarely amounts to less than half of the class. However, over the past 20 years substantial numbers have transferred to McGill, Columbia, Cornell and Johns Hopkins. More recently there has been a trend for some students (last year 25% of the graduating class) to divert in their training program at the end of the second year of medicine to a Ph.D. program in one of the basic sciences. There are features in our curriculum which have been designed to facilitate this diversion.

A somewhat similar approach has been adopted by the University of Indiana, which has not only a 4-year school in Indianapolis, but a 2-year school as well at its campus at Bloomington. Until recently their 4-year program was split—the first two years at Bloomington, the last two years at Indianapolis. When the Indianapolis campus became a full four-year campus it was decided to continue a program at Bloomington.

Dr. Lee Powers, Associate Director of the Association of American Medical Colleges, wrote the following with regard to our study:

> As you give thought to the question of a two-year program in basic medical science, it must be remembered that as far as the two-year program is concerned the situation is vastly different than it was several years ago when these programs fell into disrepute. Two things account for this:
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> 1) The faculty of a basic science program now has access to funds which can support both research and doctoral training programs. This gives a status that has never before been possible.
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> 2) The trend to mesh the upper division of the liberal arts with the basic years of medicine, on the one hand, and with graduate work in biology, on the other, thus

doing away with the lock-step fixed curriculum which has been stifling medical education for so many years, is quite applicable to the two-year program. These two trends should raise the level of scientific competence into medicine and medical education, something that must happen as the knowledge important to medicine continues to increase at an ever accelerating pace.

In fact, the "two-year" tag may now be a misnomer. It suggests educational limitations of a kind not consistent with the modern concept of decreasing curricular rigidity. We hope that if the "two-year" tag is to pertain it can be built around programs which we like to designate as "human biology." Certainly there has been scant attention to the educational foundations of graduate students in the behavioral sciences. On the other hand, there are few institutions in which the medical student can choose one of several pathways toward the doctorate in medicine.

Many students on entering medical school are identifiable as potential academic people, investigators, or individuals who can practice medicine on the basis of the highest scientific standards. It is rarely possible to incorporate in their pre-clinical years supporting studies in mathematics, physics, advanced chemistry, behavioral sciences, genetics, zoology, and the like in combinations imaginatively arranged to support medical interests which many of these students would like to define within broader perimeters. The implications of modern scientific advances and the programs of a thousand or so post-doctoral research fellows appointed each year indicate to me an effort on the part of these individuals to compensate for this lack of educational opportunity. With increasing frequency we see the graduate school alumnus seeking orientation and familiarity with problems of human biology, both in breadth and depth, through the post-doctoral fellowship and also using this device to gain belated competence in scientific research.

In sum, the three main advantages to be derived from a 2-year school of basic medical sciences are:

1. More effective use of the facilities and personnel at the 4-year schools
2. Greater physician output at the least possible expense

3. Mechanism for education of Ph.D.'s in the basic medical sciences.

These advantages far outweigh the reported disadvantages. The 2-year school of basic medical sciences should be strongly encouraged.

Prospects for a School of Basic Medical Sciences

Maryland's ability to take advantage of this approach, however, is another matter. Cost is not the major problem for the 2-year school is relatively inexpensive.* Maryland's problem stems from the fact that a university setting with strong graduate programs in the sciences is essential. Aside from The Johns Hopkins University and the University of Maryland there is no academic institution in the State with appropriate graduate programs.

Some thought was given as to the feasibility of creating a university by attaching a school of basic medical sciences to one of our existing undergraduate schools. This posed some rather fundamental problems. One of the strongest campuses in Maryland is Goucher College. It has sent an unusually high number of its students on for Ph.D.'s in both the physical and biological sciences. However, a school of basic medical sciences at an institution such as Goucher would force a fundamental change in the basic concept of the school. It would almost of necessity have to become coeducational at the graduate level. It would possibly require some augmentation of its undergraduate faculty. It would impose a very considerable financial drain on its resources, and in these times private institutions, as they are now constituted, generally have an extremely difficult time financing their operations without the added responsibilities for medical education.

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* Dartmouth estimates that the cost of its new physical plant and faculty expansion will come to $10,000,000. This includes an estimated $3,200,000 for the basic science building, and a rough estimate of $1,300,000 for an auditorium, medical library, and an enclosed bridge connecting the school to the nearby hospital facility. The $10,000,000 expansion does not include any monies for the hospital center with which the school is affiliated. $4,300,000 of the required $10,000,000 was secured from four contributors—the Rockefeller Foundation, U.S. Public Health Service, Commonwealth Fund, and Ford Foundation. The remainder will be secured from alumni and from a number of small foundations. It is anticipated that of the $10,000,000, about half will be used for construction and maintenance, and the other half for endowment of faculty salaries. Brown University, which is planning a 2-year school, contemplates a $15,000,000 cost, some of the money apparently to be used to strengthen programs which will provide support for the two-year curriculum.

We considered the feasibility of Morgan State College. Balancing all factors we concluded that there would have to be fundamental strengthening of its undergraduate program both from a program and physical plant viewpoint before any consideration could be given to a graduate program.

At every point in our analysis we came back to the fundamental problem that as desirable as a school of basic medical sciences might be—to help us meet our obligations to the nation, to permit full utilization of our present medical school resources, to educate more Ph.D.'s in the basic medical sciences, to eliminate reliance upon foreign medical graduates—there is no university in Maryland today at which it might suitably be based, though conceivably a university could be created around one of the existing college campuses. From the medical viewpoint there would appear to be an emerging crisis in graduate education.

In the region around Maryland only the University of Delaware and Catholic University appear to have immediate potential in this regard. Our basis for this judgment was derived from data submitted by the National Institutes of Health (Appendix III), which indicates the general academic strength in certain fields at the various universities in this area. (Except for the Catholic University, University of Delaware, and American University, each of these institutions in Maryland, Delaware, Virginia, and the District of Columbia already has a medical school.)

It would be possible, of course, for a 2-year school to be part of either The Johns Hopkins University (Homewood campus) or the University of Maryland (College Park campus). This possibility would have to be weighed carefully and, in particular, the extent determined to which such a move would adversely affect the existing 4-year medical schools. The feasibility of this approach would appear doubtful since both medical schools have unmet physical plant needs, the meeting of which should take priority over the development of any 2-year school.

Additional Medical Schools

When we consider the possible locations for a 4-year medical school some of the same factors need to be considered.

With a growing dependence of medicine upon such sciences as nuclear physics and physical chemistry, and upon such disciplines

as psychology and sociology, the need for close interchange between the medical faculty and other faculties is most desirable: the medical faculty can draw upon the other faculties for needed consultation and advice; the faculties become primary resources for each other. Hence, the value in close university affiliation. Almost as important, however, may be that intangible atmosphere created by an educational institution—the academic tradition as against the institution which is vocationally oriented; this factor can appreciably assist in the recruitment of faculty.

This would seem to suggest that university affiliation for a medical school may be more than just desirable—in fact, essential. If this be so, then Maryland would have no opportunity at this time for a medical school, since we have only two universities and they both already have medical schools. In the surrounding area, Delaware could possibly handle a school since it has a university, there is a large enough population to support a school both clinically and economically, and there is no medical school in the state at present which allows Delaware students to matriculate in medicine and thereby participate in meeting a national need. Catholic University, if university affiliation is desirable or essential, is another possibility, considering the academic strength which already exists in the sciences and other pertinent fields; this university could conceivably use the complex of Catholic hospitals in Baltimore as its clinical resource, thereby achieving a medical school at a comparatively small cost.

University affiliation for a medical school, while highly desirable, is by no means felt to be essential by everyone. Some point out that the goals sought through university affiliation are rarely achieved; the affiliations are nominal, the interchange between faculties minimal if existent at all. Others point out that a number of good medical schools exist today which are not university affiliated and that any support needed by such schools from other scientific areas can be readily obtained without being part of a university. It is also pointed out that even if university affiliation is desirable, one must balance this with our national and international needs for quantity; there is no point insisting upon highly scientific, university based medical education if not enough doctors become available to meet people's needs.

Those who feel university affiliation is not necessary for a 4-year school generally concede, however, that for a 2-year school

of basic medical sciences it is essential. They see no contradiction in these viewpoints; the pre-clinical studies when part of a 4-year school, they argue, can have a sufficient focus toward the clinical areas to operate without university affiliation; while great trained medical researchers and teachers may not result from their non-university educational process, competent physicians to treat people do get developed.

When one removes the university requirement, one finds extensive clinical resources in Maryland which could provide a medical school base. We have already mentioned the complex of Catholic hospitals. But by far the most likely resources are Baltimore City Hospitals and Sinai Hospital. Each has teaching and research programs, some full time staff, good facilities, and room for expansion.

Nominal university or college affiliation could, of course, be achieved with one or more of the existing universities and/or undergraduate colleges. This need not require financial support from the universities or colleges. They could grant part-time appointments to the medical school faculty and receive from the faculty some assistance in their own research and teaching programs. The new medical school, on the other hand, would thereby benefit from some of the academic atmosphere and tradition. Whether this would assure an educational program of desired strength and quality is another matter.

While most experts strongly recommend university affiliation, the official position of the American Medical Association and of the Association of American Medical Colleges is:

> A medical school should be incorporated as a nonprofit institution, if possible as a part of a university, since a university can so well provide the milieu and support required by a modern medical school.
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> If not a component of a university, a medical school should have a board of trustees composed like that of a university of public spirited men or women having no financial interest in the operation of the school or its associated hospitals.*

The subcommittee debated the merits of university affiliation for some time. We concluded that the advantages of intimate uni-

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* *Functions and Structure of a Modern Medical School.* Statement Prepared through Collaboration with Council on Medical Education and Hospitals, American Medical Association, and the Association of American Medical Colleges, page 3, section III.

versity affiliation far outweigh the arguments in favor of a non-university medical school: the former provides greater assurance of quality, the academic tradition of freedom and excellence, greater ease in recruitment of faculty, and the broadest possible base for the education of physicians steeped in the basic sciences and other relevant graduate fields. The matter of faculty recruitment, by itself, is a prime factor in favor of the university approach, for there are presently critical shortages of competent faculty. Any new, non-university medical school would have an exceedingly difficult job recruiting a good faculty both because the school would be new and because it would not be part of a university. The value of university affiliation is further enhanced by the opportunity for consultation with other graduate faculties. The growing need to call upon such additional resources as law, nuclear physics, sociology, physical chemistry, can be greatly facilitated when all are part of the same institution. It is, of course, true that many, if not most, university based medical schools have not achieved the desired rapport with other faculties of their respective universities. Notwithstanding, we believe that when such interchange is accomplished the quality of the physicians graduated (and of the students recruited) far exceeds those from schools with nominal or no university affiliation.

We would therefore recommend:

1. The planned expansions at the two medical schools should be given full and prompt support by the Maryland state government as our minimal contribution to the present national need for physicians.

2. The trustees of both universities should direct that a study of the medical school programs be made to see if the schools, between them, cannot by 1971 further absorb 22 students in their entering classes. This would assure fulfillment of our minimal national obligation to graduate by 1975 the same ratio of physicians as we graduated in 1959. This restudy should include any necessary physical plant expansion to attain the required added admissions. Since the graduate goals are a state obligation, state government should be prepared to support any required expansions financially. This study should be given priority by the trustees since planning efforts by other bodies will depend upon their findings.

3. Schools of basic medical sciences are needed nationally. The feasibility of meeting future needs by such a school in Maryland, with a class size of at least 42 students, should be determined at once. Since our two medical schools will be able to take additional students in the third year, regardless of whether they enlarge their entering classes, a 2-year school would thus provide for maximal development of our medical schools and for greater effort in meeting national and international needs, while at the same time helping to overcome the dangerous dependence upon foreign trained physicians. A 2-year school would allow for the education of more Ph.D.'s in the basic medical sciences, doctorates now in short supply. A 2-year school would provide the basic framework for development of a 4-year school should the present medical schools be unable to expand sufficiently or should the need otherwise arise. The State of Maryland should be prepared to grant substantial financial assistance in the development of this school.

Since the structuring of a medical curriculum is involved, since medical school affiliation is highly desirable, and since appropriate clinical affiliations are mandatory, the Committee on Medical Care should appoint a select subcommittee of medical educators to ascertain which college campuses in Maryland would be most appropriate for the needed school of basic medical sciences and the mechanism by which it might be achieved. The subcommittee should have at its disposal the report of the Hopkins and Maryland trustees indicating the extent to which those medical schools might expand.

CHAPTER FOUR

Ph.D NEEDS IN THE MEDICAL SCIENCES

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. Ph.D.'s in the medical sciences are in short supply.
2. The nation's educational institutions are graduating less than the needed number of Ph.D.'s in the medical sciences.
3. The number of physicians graduated from the nation's medical schools and our medical research efforts will relate directly to the nation's ability to educate the required number of medically oriented Ph.D.'s.

Recommendations

1. Undergraduate curricula in the biological sciences should be strengthened by the trustees of colleges throughout Maryland as a means of encouraging qualified students to embark upon doctoral (Ph.D.) studies in the medical sciences.
2. Doctoral (Ph.D.) programs in medical schools and basic medical science schools should be enlarged consonant with the quality necessary to assure the attraction of qualified candidates.

Ph.D. Needs in the Medical Sciences—Discussion

The Ph.D. in the medical sciences is an essential factor in considering our ability to meet future needs for physicians. Twenty-seven per cent (27%) of medical school full-time faculty members have a Ph.D.; 4.5% have both Ph.D. and M.D. degrees.

The exact role of the Ph.D. in medical education can be understood more fully by analyzing the 27% figure cited above: when one distributes the Ph.D.'s between the basic sciences and clinical sciences, one sees that 68% of the basic science faculties (excluding pathology) are Ph.D.'s. Table 3 presents this breakdown in detail.

If one considers the budgeted unfilled full-time faculty positions in medical schools one notes a trend which is cause for concern. For this, see Table 4.

Shortages exist and are becoming more acute both at the clinical and basic science levels. The shortage is probably even more acute if one recognizes that the various departments undoubtedly have needs beyond those for which budget is allowed, since budget officials are generally reluctant to budget for more positions when a number of the same already budgeted positions are unfilled.

Overcoming clinical shortages (mostly the M.D.'s) should be an easier task than overcoming the Ph.D. shortage (which predominates in the basic science area). The reason is that qualified M.D.'s are available, oftentimes as full-time private practitioners or part-time faculty members; these need to be encouraged to enter full-time teaching. In addition, the opportunity exists for encouraging more of the new graduates to enter the teaching phase of medicine. The M.D. faculty shortage is thus largely a distribution problem. The Ph.D. shortage, however, is a shortage in numbers: the

Table 3

FULL-TIME FACULTY PERSONNEL BY FIELDS AND DEGREES HELD IN MEDICAL SCHOOLS IN THE UNITED STATES

	M.D.		Ph.D.		Both		Other		Total	
Field	No.	%	No.	%	No.	%	No.	%	No.	%
Anatomy	155	22.0	475	67.3	44	6.2	32	4.5	706	100.
Biochemistry	46	6.7	582	85.0	35	5.1	22	3.2	685	100.
Biophysics	12	12.9	66	71.0	3	3.2	12	12.9	93	100.
Biostatistics	1	—	2	—	1	—	0	—	4	—
Genetics	3	—	4	—	1	—	0	—	8	—
Microbiology	113	20.5	374	67.8	28	5.0	37	6.7	552	100.
Pharmacology	138	31.8	230	53.0	51	11.7	15	3.5	434	100.
Physiology	135	23.8	351	61.9	58	10.2	23	4.1	567	100
Physiology-pharmacology	8	—	27	—	3	—	1	—	39	—
Subtotal	611	19.8	2111	68.4	224	7.2	142	4.6	3088	100.
Pathology	626	82.6	72	9.5	27	3.6	33	4.3	758	100.
Subtotal	1237	32.2	2183	56.8	250	6.5	175	4.5	3845	100.
Medicine	1497	89.6	80	4.8	57	3.4	37	—	1671	—
Obstetrics-gynecology	294	90.5	18	5.5	10	3.1	3	—	325	—
Pediatrics	618	88.3	27	3.8	24	3.4	31	—	700	—
Psychiatry	520	64.0	207	25.5	11	1.4	74	—	812	—
Pub. Health-Prev. Med.	192	49.6	85	22.0	19	4.9	91	23.5	387	100.
Radiology	370	82.8	36	8.1	10	2.2	31	6.9	447	100.
Surgery	790	90.5	29	3.3	43	4.9	11	1.3	873	100.
Other clinical	1028	79.8	123	9.5	41	3.2	97	7.5	1289	100.
Subtotal, all clinical	5309	81.6	605	9.3	215	3.3	375	5.8	6504	100.
Overall total	6546	63.3	2788	26.9	406	4.5	550	5.3	10350	100.

Source: JAMA, Vol. 171, No. 11 (Nov. 14, 1959), page 1528.

Table 4

BUDGETED UNFILLED FULL-TIME FACULTY POSITIONS IN MEDICAL SCHOOLS IN THE UNITED STATES (1954-1955 TO 1958-1959)

Field	1954-1955	1955-1956	1956-1957	1957-1958	1958-1959
Anatomy	25	18	22	45	55
Biochemistry	9	8	17	28	20
Biophysics	—	—	—	—	9
Microbiology	14	15	18	41	40
Pathology	27	33	46	58	60
Pharmacology	16	19	17	32	35
Physiology	16	15	21	35	29
Genetics	—	—	—	—	1
Subtotals	107	108	141	239	249
Anesthesiology	5	10	6	24	30
Dermatology	—	—	—	—	3
Medicine	23	28	29	55	48
Neurology	—	—	—	—	12
Obstetrics & Gynecology	14	16	13	28	47
Ophthalmology	—	—	—	—	11
Orthopedics	—	—	—	—	4
Otolaryngology	—	—	—	—	7
Pediatrics	15	12	21	35	43
Physical Medicine	—	—	—	—	6
Psychiatry	30	21	29	55	61
Pub. Health & Prev. Med.	17	14	19	44	34
Radiology	11	8	—	30	36
Surgery	19	22	42	44	48
Urology	—	—	—	—	12
Other clinical dept.	17	12	31	65	4
Subtotals	151	143	190	380	406
Totals	258	251	331	619	655

Source: JAMA, Vol. 171, No. 11 (Nov. 14, 1959), page 1531.

Ph.D. in the basic medical sciences is generally committed to teaching or research; he is not a private practitioner and rarely a part-time worker (excepting those few female Ph.D.'s who often work part time while fulfilling family obligations). The Ph.D. shortage needs to be met by encouraging more students to enter the medical sciences. This can be accomplished in large part by appropriate strengthening of the undergraduate programs in biological sciences.* There is, however, another factor—i.e., good doctoral programs to encourage graduate study.

Nationally the A.M.A. reports ** that in 1958-1959 there were a total of 2,087 doctoral (Ph.D.) positions in basic medical sciences available through medical schools, but only 1,590 students matricu-

* Areas for such development are suggested by data contained in the appendix (Appendix IV).

** JAMA, Vol. 171, No. 11 (Nov. 14, 1959), page 1524f.

lating. In the Maryland-D.C. area of 108 doctoral positions, 105 were filled.*

Where a doctoral student matriculates usually depends upon the quality of the program available. This, in turn, generally reflects the stature of the professors heading those programs, for doctoral students generally seek to study under specific people. One might conclude, therefore, that the schools which have their doctoral positions fully subscribed represent programs of good quality, based on outstanding faculty. This is supported by the data on those medical schools which have recognized programs of quality.**

Thus, the large number of doctoral openings in the nation is not cause for satisfaction. To some extent, to be sure, there are no takers because there is no desire to enter the medical sciences. The recent study indicating that the biological field is not drawing its proportionate share of individuals of the highest intelligence bears this out.*** But also, and we believe to a greater extent, there are no takers because the programs leave much to be desired.

It would be advantageous to have the doctoral programs enlarged in selected schools. Maryland and the District of Columbia medical schools have been able to fill their doctoral positions because of program and faculty excellence. The extent to which they can expand would be all to the good. Their programs of excellence suggest a pattern for development by any other university that is created in this area.

How many Ph.D.'s we will need is difficult to calculate. Certainly we will need more, simply because of existing shortages and because we plan national expansions of medical schools as well as the creation of new medical schools. But in addition, medical research is growing at a rapid rate, and in the research area the Ph.D. is a key person.

We might note in this regard that in 1958 the nation's medical schools awarded in the basic medical sciences only 282 Ph.D.'s; in 1959 they awarded only 258 Ph.D.'s; in 1960 they awarded 275 Ph.D.'s. See Table 5.

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* The three unfilled positions were in physiology at the University of Maryland. A probable reason for the Maryland openings was the imminent retirement of the professor. Knowledge of this retirement would tend to deter students from beginning in that program since doctoral students generally desire to begin and finish their doctoral studies under the same professor.

** Ibid., page 1524f.

*** Lindsey R. Harmon, *High School Backgrounds of Science Doctorates*, appearing in *Science*, 10 March 1961.

Table 5

ENROLLMENTS FOR ADVANCED DEGREE AND POSTDOCTORAL STUDIES, AND DEGREES AWARDED IN SELECTED BASIC SCIENCE DEPARTMENTS OF UNITED STATES MEDICAL SCHOOLS FOR YEARS 1956-1957 TO 1959-1960 INCLUSIVE

Department		1956-1957	1957-1958	1958-1959	1959-1960
Anatomy Enrollment	M.A.	107	165	151	141
	Ph.D.	159	159	180	223
	Post-doctorate	35	11	19	56
Degrees granted	M.A.	—	36	41	40
	Ph.D.	—	30	29	18
Biochemistry Enrollment	M.A.	269	239	235	231
	Ph.D.	419	457	512	539
	Post-doctorate	66	52	97	154
Degrees granted	M.A.	—	61	48	60
	Ph.D.	—	75	78	95
Biophysics Enrollment	M.A.	28	67	33	28
	Ph.D.	52	57	38	46
	Post-doctorate	0	39	18	13
Degrees granted	M.A.	—	21	23	18
	Ph.D.	—	8	8	7
Microbiology Enrollment	M.A.	225	247	250	224
	Ph.D.	240	279	289	329
	Post-doctorate	22	26	35	66
Degrees granted	M.A.	—	75	58	79
	Ph.D.	—	77	52	53
Pharmacology Enrollment	M.A.	67	127	101	108
	Ph.D.	163	174	229	253
	Post-doctorate	12	28	50	82
Degrees granted	M.A.	—	16	24	31
	Ph.D.	—	38	32	43
Physiology Enrollment	M.A.	163	203	240	230
	Ph.D.	235	260	233	404
	Post-doctorate	26	40	64	122
Degrees granted	M.A.	—	58	50	63
	Ph.D.	—	45	43	50
Total Enrollment *	M.A.	921	1,119	1,124	1,099
	Ph.D.	1,304	1,416	1,590	1,961
	Post-doctorate	192	219	359	603
Degrees granted	M.A.	—	282	267	331
	Ph.D.	—	282	258	275

* Total includes Genetics, Pathology, and "Other," not listed above.
Source: JAMA, Vol. 174, No. 11 (Nov. 12, 1960), page 1443.

In the clinical sciences, as might be expected, far fewer degrees were granted:

	1958-1959	*1959-1960*
M.A.	267	284
Ph.D.	24	17

Medical school programs are not, however, the sole source for developing the Ph.D. Many receive their degree in the programs offered by other university departments. The schools of basic medical sciences are an especially productive area for developing medi-

cally oriented Ph.D.'s. The demand for Ph.D.'s in the medical sciences, regardless of where secured, is considerable: in addition to schools of medicine, they are sought after by research institutes, dental schools, public health schools, public health and mental health departments, teaching hospitals, veterinary schools, colleges, as well as by other university departments.

The developing shortages of suitably trained medical school faculty is cause for concern. The need to expand the number of Ph.D. programs is apparent, and particularly those programs in medical school (and basic medical science school) departments since these present the best opportunity to assure appropriate medical orientation. Unless these faculty needs are met, our medical education and research efforts will perforce decelerate.

As with physicians, Maryland's need will be met if national needs are met. Since Maryland is a research center, any existing and foreseen shortages should be cause for particular concern.

CHAPTER FIVE

STUDENT SELECTION AND ASSISTANCE

Conclusions and Recommendations

Conclusions

1. More students, and in particular a larger proportion of the better students, must be persuaded to undertake medical training.
2. A crisis may be developing in education whereby the educational systems will be unable to meet the demand at the graduate level for students.
3. The high cost of medical education is central to the problem of getting more doctors for the nation.
4. The student potential of our Negro population is not being developed to its utmost.

Recommendations

1. College trustees and the appropriate state-wide planning bodies should make certain that the pre-medical and other scientific curricula are of sufficient quality and quantity to enable the needs at the graduate level to be met.
2. Increased scholarship and loan funds should be provided by both state and federal government for administration by Maryland's medical schools. The deans of the two medical schools should jointly develop a plan for State action. The sums proposed in the Administration bill now before the Congress (H.R. 4999) should be the minimal sum appropriated; if not fully appropriated the respective states should at least make up the difference. State funds should not be restricted to residents of that state, nor should matriculation in the state be required of its residents who are recipients of state aid. In addition, medical schools should make an increased effort to obtain funds from private sources, such as medical school alumni, industrial and business groups, and foundations.
3. The potential of our Negro population should be more effectively employed to meet our needs:

a. by strengthening education programs in primary and secondary schools, and in colleges;

b. by accelerating the trend toward equal opportunity as regards admission to medical schools and the availability of internships, residencies, and staff appointments in hospitals. While community attitudes are a significant factor in this matter, leadership responsibility for correcting the internship, residency, and staff appointment problem rests with a number of people and organizations, each of which must meet this responsibility in the immediate future: hospital trustees, The Hospital Council, hospital medical staffs, Medical and Chirurgical Faculty, and the State Department of Health. The State Department of Health, in partial fulfillment of its legal responsibility for the public's health, should call together representatives from each of these groups to discuss the problem collectively, and to issue a joint report as soon as possible on action that is contemplated.

Student Selection and Assistance—Discussion

Source of Students

There were 14,952 applicants to medical schools in the United States during 1959-1960, each applicant filing an average of 3.9 applications. Fifty-seven percent (57%) of those applicants (8,512) were accepted by one or more schools and matriculated.

A total of 213 Maryland residents applied for admission during that year, and 61.5% of them (130) gained acceptance(s). From the District of Columbia 139 applied to medical schools, 46% of whom (63) gained admission.

Of the 130 Maryland residents, 81 entered public medical schools, while 49 entered private schools. Significantly, 29 of the 49 private school students matriculated at schools in the Washington-Baltimore area; the remainder were scattered in schools throughout the country. The total of 130 students represented about 4.5 students per 100,000 population. The national average of entering students to population was 4.7.

For the District of Columbia during 1959-1960, 63 residents entered a medical school—60 of these to private schools, and 47 of that 60 to schools in the Washington-Baltimore area. The remainder

of the private school students and the 3 public school students were scattered throughout the nation. The total of 63 students represented a ratio of approximately 7.8 students per 100,000 population, the highest ratio in the nation that year.

An interesting figure develops from the statistics of the year before (1958-1959): 20 states had higher ratios of acceptance than Maryland; 17 states had a higher ratio of applications than Maryland, 14 of which were also among the 20 states which had higher ratios of acceptance.

For 1959-1960, the distribution of the 130 Maryland and 63 District of Columbia students, and the source of students in each school in this area, is noted in Table 6.

Place of Practice

Where students came from needs to be balanced by information on their place of ultimate practice. A study appearing in the December 1960 issue of The Journal of Medical Education summarized the factors known to influence the choice of a physician's place of practice. The Journal cited:

> . . . demand for medical services, location of the medical college attended, place of residence before entering medical college, place where internship and/or residency was served, the methods and quality of transportation and communication, ready accessibility of hospital and consultation facilities, climate, availability of good schools, and many other personal, social, and economic factors.

Table 6

	State of Maryland	District of Columbia	From Other States	Total in Entering Class
University of Maryland	77	—	23	100
The Johns Hopkins	9	2	67	78
Georgetown	12	10	91	113
George Washington	5	16	81	102
Howard	3	19	83	105
	106	47	345	498
Scattered through other schools, public and private	24	16		
Total	130	63		

Source: JAMA, Vol. 174, No. 11 (Nov. 12, 1960), page 1448ff.

Table 7

PERCENT OF GRADUATES IN PRIVATE PRACTICE IN SAME CITY AND STATE AS THEIR PRIOR RESIDENCE: 1950 CLASS

	Same City as Prior Residence	Same State
National	25.0	57.8
Public control	23.9	60.2
Private control	25.9	56.1
Maryland	37.0	59.3
Hopkins	16.2	45.9
Georgetown	33.3	71.8
George Washington	13.0	28.3
Howard	33.3	57.1

The authors found that when considering the physicians in private practice (using the 1950 graduates as a study base) the "private medical colleges percentagewise contributed more private practitioners to their own states in relation to the number of graduates drawn from their own states than did the public medical colleges (with restrictive geographic admission policies)." *

Graduates who go into private practice tend to return to their state of original residence regardless of where they are trained,** as Table 7 shows.

These figures, however, refer only to those in private practice, and must be balanced by recognition of the fact that an appreciable percentage are not in private practice, and these are a particularly mobile group. See Table 8.***

One other trend is noted,**** however, which has considerable significance, and is noted in Table 9. This clearly indicates the growing importance of internship and residency as determining the place of practice. This is understandable in that during residency and internship the physician develops innumerable contacts, and

* Weiskotten, et al.; *Trends in Medical Practice,* Journal of Medical Education, Dec. 1960, page 1091.
** Ibid., page 1111.
*** Ibid., page 1098.
**** Ibid., page 1086.

Table 8

PERCENT OF GRADUATES IN PRIVATE PRACTICE: 1950 CLASS

National	77.6
Maryland	84.4
Hopkins	72.5
Georgetown	70.9
George Washington	81.0
Howard	62.9

Table 9

PERCENT OF GRADUATES WITH RESIDENCY TRAINING PRACTICING IN SAME STATE AS:

	Year of Graduation	
	1945	1950
Residency training	58.8	62.8
Prior residence	54.6	52.5
Internship	42.3	47.5
Medical college	42.4	42.3

establishes liaisons which will inevitably assist him in developing a practice.

If one were to attempt to summarize what the preceding discussion and charts indicate, it is this: place of residence is an important factor in determining where a physician will settle. It is, however, not the sole factor. The graduate (internship and residency) and postgraduate educational opportunities play a great part in this determination as does the supply and demand for physicians. What is of prime importance is that the state develop its fair share of qualified students to enter medicine, *regardless of where they go.* Emphasis on this last point is indicated from a study of the periods from 1948-1953. Maryland sent into medicine a total of 630 students during those years. They went to schools in various parts of the country, including the two schools in Maryland. The doctors in the graduating classes from all schools for those years who are now resident in Maryland are 691. This might tend to suggest that Maryland's demand for physician services is 61 more than its input of students. When one allows for attrition in the 630 (about 63 students if we accept the present national average attrition rate) then the resulting difference of 124 (61+63) between our demand and our input becomes rather pronounced. However, one must recognize that Maryland is a state in which there has been considerable in-migration, and it can be assumed that during these years the in-migrants sent at least some students into medicine from their original states, and also with the population shift from other states physicians were among those moving into Maryland. This study also showed that the two Maryland schools during this period graduated a total of 994 physicians.*

* This study was conducted by the subcommittee's staff and consisted of a count of physicians listed in the 1958 A.M.A. Directory (28th edition).

Method of Student Selection

All medical schools in this country now require, or recommend, that the applicant take the Medical College Admission Test. This test, advises the Association of American Medical Colleges, ". . . is designed particularly to help students plan their application strategy and to give them some idea what to expect. . . ." *

This test tends to compensate for the lack of uniformity in grading between colleges by approximating parity between the A student in one college who, if he went to some other college, would only be a B student. Plans are reportedly in process to modify the test over a period of time so that its efficiency as a measure of student abilities will be further improved.

The relative importance given to grades, recommendations, and test scores are reported by the Association of American Medical Colleges in Table 10.

Admission policies vary from school to school. The two most common restricting factors are race and residency. The former exists in a number of southern universities which exclude Negroes. The latter—residency—is a common restriction in most state uni-

* Admission Requirements of American Medical College, 1960-1961, AAMC, Evanston, Ill., page 26.

Table 10

METHODS OF EVALUATING THE INTELLECTUAL CHARACTERISTICS OF APPLICANTS

Evaluation Method for Intellectual Characteristics	% of 534 Admission Committee Members Attaching: Great Importance	Some Importance	Little or No Importance	Not Used	No Response
Over-all grades from college transcripts	73	26	*	*	*
Science grades from college transcripts	70	29	1	*	*
Nonscience grades from college transcripts	27	69	2	*	1
MCAT test scores	37	55	4	3	1
Individual letters of recommendation from undergraduate faculty members	30	56	10	2	1
Letters of recommendation from other than undergraduate faculty	2	32	63	2	1

* Less than 1 per cent response.

Source: Admission Requirements of American Medical Colleges, 1960-1961, AAMC, Evanston, Ill., page 25.

versities and in some private schools. State universities tend to limit, and in some instances bar, non-state students. Some schools give preference to students from the region. Other schools make an effort to secure a broad cross-section of qualified students from many states, the policy—it might be noted—at The Johns Hopkins University School of Medicine. The University of Maryland gives priority to residents of Maryland and has always been able to accept all qualified residents who apply. This usually leaves unfilled 20 to 25 places out of 100 in each incoming class which are then filled with the best available out-of-state applicants. No racial preference exists at Maryland or Hopkins.

A loose residency requirement, such as the University of Maryland employs, is perhaps justifiable for a state operated school. The school is not required to admit the desired percentage of state residents if they do not qualify. It is doubtful, however, that any wisdom exists in the mandatory residency requirements imposed upon some of the schools in other areas. Strict residency requirements simply encourage the acceptance of less than qualified students for medical education. But more important is the fact that because of population movements, and with it the movement of physicians, it is doubtful that strict residency requirements serve any useful purpose. Recent statistics indicate that the determining factors on ultimate place of practice are not whether the students go to their own schools, but rather that residents get into medical schools somewhere and that the graduate education programs in the state be of sufficient quality to attract state residents and non-residents from wherever they received their undergraduate training in medicine.

Costs of Medical Education, Including Loans and Scholarships

The length of time required to become a physician is considerable. Following pre-medical training there are 4 years of medical school, 1 year internship, and for most 2 or 3 years residency. On top of this is required 2 years of military service for male graduates of draft age; this unique requirement is made upon no other group or profession.

The cost of medical education is also high. The Association of American Medical Colleges reports that "the average unmarried student estimates his cash outlay for all four years at $9,800; the comparable figure for married students with two or more children is

$16,000".* These estimates were derived from a poll of all 1959 graduating medical students. The AAMC also reports that "all medical schools have various sources of financial aid to students, usually in the form of loan funds, tuition and full-expense scholarships, and opportunities for part-time or summer employment. According to a survey made in 1957, the average amount loaned to students per year per school is $20,381".**

The American Medical Association has launched a medical education fund to provide scholarships but the sums involved are not of great magnitude. Some states provide financial aid, though Maryland does not. The federal government provides loans through the National Defense Education Act, but no scholarships. By and large in the scientific field the absence of federal scholarships at this time is unique to medicine; they are available for many other scientific areas. Recent reports at the national level have called for correction of this apparent inequity.

The AAMC reports *** on sources of medical student support. See Table 11.

The estimated costs of medical education for the Maryland-District of Columbia schools are reported by the AAMC in the same document in Table 12.

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* Ibid., page 32.
** Ibid., page 33.
*** Ibid., page 33.

Table 11

MEDICAL STUDENT REPORTS OF SOURCES UTILIZED BY THEM IN MEETING EXPENSES DURING FOUR YEARS OF MEDICAL SCHOOL (1959 FOURTH-YEAR STUDENTS; MULTIPLE RESPONSE)

Source	% Using Source	Mean $ per Source
All students (N = 4887*)		
Gifts and loans from parents and family	84	$5680
Summer earnings	71	1454
Earnings during school year	57	2079
Scholarships	25	1698
Loans from medical school	18	996
Loans from other than family and school	15	2141
GI Bill	11	3721
Other	19	3369
Married students (N = 3042)		
Wife's earnings	64	4800
Gifts and grants from wife's parents and family	20	2038

* Representing a 72 per cent return

Table 12

ESTIMATED COSTS OF MEDICAL EDUCATION

	Tuition		Room and Board—Minimum	Books and Supplies	Microscope	Total Estimated
	Resident	Non-Resident				
Johns Hopkins	$1280	$1280	$ 950	$160	$300-$563	$2690-$2953
U. of Maryland	786	936	800	200	200- 350	1986- 2286
George Washington	1200	1200	900	135	200- 350	2435- 2585
Howard	592	592	550	135	up to 350 (rental possible)	up to 1627
Georgetown	1260	1260	1000	250	150- 350	2660- 2860

These are 1959 costs. In many instances costs, including tuition, have already gone up.

Both The Johns Hopkins University School of Medicine and the University of Maryland School of Medicine report a great need for additional scholarship funds.

The American Medical Association News reported the following in its November 28, 1960 issue:

> Medical students pay more than twice as much as Ph.D. students for their education and receive only one-fourth the financial assistance from scholarships, fellowships, and assistantships, according to a report presented before the annual meeting of the Assn. of American Medical Colleges.
>
> The same report showed that more than 80% of the funds used to pay the student's cost of medical education come from the student and his family.
>
> AAMC's study and report show:
>
> (1) Average direct cost of medical school (living costs excluded) to the medical student is about $1,000 a year for four years compared to $450 yearly for four years for the Ph.D. student.
>
> (2) About 50% of medical students receive some form of stipend income (scholarships, fellowships, assistantships) compared to 61% of Ph.D. students. Medical students receive an average of $500 a year, graduate students $2,000.
>
> (3) 85% of medical students received parental help in contrast to 22% of the Ph.D. students.
>
> The report's author, Dr. J. Frank Whiting of AAMC's staff, noted 'there exists an 8-1 fiscal ratio of income and expense working to persuade the college student to enter graduate instead of medical school.'

Dr. Whiting said 'in 1957-58 the students' cost of medical education began to outrun the financial resources of even those families in the U. S. who are in a fairly comfortable financial position. At the same time in 1957-58 international events brought about increases in stipends to graduate students in the natural and social sciences with which medicine was and is in no position to compete.'

The report also showed: (1) 62% of the medical students in the 1959 graduating class were married and that costs of medical education rise if the student is married. (2) Gifts and loans from parents, relatives were the largest single source of funds for both single, married students. 85% of all students use this source. (3) Student earnings and/or wife's earnings are second largest source of funds, comprising one-fifth of the resources of medical students, married or single. (4) Loans, scholarships accounted for about 8% of students' funds.

It would seem reasonable to conclude from the foregoing discussion that the high cost of medical education as compared to the costs in other prestige professions acts as a deterrent to students who might otherwise choose medicine as a career. The length of training in other fields is shorter, the opportunity for part time work during the school year is far more feasible, the opportunity to interrupt the educational process for a year or two in order to work is practicable, scholarships are more common and adequate, and the availability of federal aid existent. Additional deterrents are the common knowledge among college students that there is a general lack of financial support to students going through medical education, and that during the long periods of internship and residency stipends are so low as to suggest indentured service. In view of these factors, medicine tends to become the profession for those from the relatively more "well-to-do" families. Unless steps are taken to overcome this tendency it will continue.

These deterrents also suggest several things with regard to student loans. Since medical students are generally heavily involved in debt, loans are of doubtful value, particularly in the early years of medical school. To pile additional economic burden upon existing burdens is a doubtful venture. Loans might have some value only in the last year or two, or during the period of internship or residency, but even here the addition of this extra burden may well be unwise.

Attrition in Medical Schools

Each year a certain number of students drop out of medical school. The reasons are many. Some simply cannot meet the academic standards. By improved selection processes, including more uniform undergraduate grading, this number can be reduced. One of the difficulties in this regard, however, is the fact that other professions are increasingly more attractive to the better students because of shorter training periods, less economic burden, etc. Some students, however, drop out for psychological and other health reasons. Others change their minds about their chosen professions. Increasingly some are diverting to other doctoral fields after one or two years of medical school. Whatever the reason, dropouts are a loss to medicine, for the time and money spent on their education could have gone to the education of a student who would end up in medicine.

The attrition picture nationally for 1959-1960 appears in Table 13. Of most concern is the attrition in the first two years. Not only does it highlight the prime area for selection process improvement but it also indicates, accepting the figures as an accomplished fact, the minimal extent to which the medical schools are prepared to expand their third and fourth year classes, given the qualified students. There were 556 dropouts for academic reasons (assuming the first year class enrollment was constant) and 317 for other reasons.

The dropout picture for the Maryland-District of Columbia schools for 1959-1960 appears in Table 14.

The loss of 74 students in the first 2 years in the 5 schools in this area suggests the minimal extent to which the third year classes

Table 13

ATTRITION IN MEDICAL SCHOOLS IN THE UNITED STATES (85)

Year	Enrollment	Withdrawal or Dismissal in Poor Academic Standing	Withdrawal or Dismissal for Other Reasons	Total	Enrollment Lost %
First	8,173	401	236	637	7.8
Second	7,563	155	81	236	3.1
Third	7,214	48	60	108	1.5
Fourth	7,134	7	14	21	0.3
Total ...	30,084	611	391	1,002	3

Source: JAMA, Vol. 174, No. 11 (Nov. 12, 1960), page 1456.

Table 14

ATTRITION 1959-1960

	Third Year Class Size Smaller Than First Year Size by:	
Maryland	13	
Hopkins	10	
Georgetown	21	
George Washington	6	
Howard	24	
Total	74	students

Source: JAMA, Nov. 12, 1960, page 1426.

can be expanded. Actually, because the clinical years can be enlarged beyond the size of the first year class, more than 74 students could be absorbed. To some extent the first year class might also be enlarged without any physical plant expansion.

Attrition figures must, however, be treated with the greatest of caution. They vary from year to year. They are warped by some who repeat a year or who interrupt (in a few instances) to undertake special studies. They are affected by the quality of students. They are increasingly affected by the number who divert to concentrate in other doctoral fields. They are further affected by changes in the size of the entering class. It is generally conceded that a liberal safety factor should be allowed for attrition, particularly since the attrition rate nationally has been rising.

Is Maryland Sending Enough Students into Medical Schools?

Maryland's ratio of students to state population is about at the national average. However, as we have seen (page 63) our physician intake over a six year period far exceeded our student input. This would suggest that we should be sending more students into medicine.

But more important for our consideration are the facts that:

1. With a population increase and with the need for more physicians, the nation as a whole (including Maryland) will have to induce more students to enter medical training;
2. It would be advantageous if medicine took a larger and fairer share of the better students than it is now getting.

Women, it should be noted in this regard, make excellent medical students and excellent physicians. Experience has indicated,

however, that many do not remain active in the profession. If ways can be found to encourage women both to enter medical training and to remain in practice, then this group represents a large and relatively untapped source of medical manpower.

To utilize the nation's full potential Maryland needs to consider, in addition to the development of female potential, three major factors: educational facilities, finances, race.

Educational Facilities

College trustees and the appropriate state-wide planning bodies should make certain that the pre-medical and other scientific curricula are of sufficient quality and quantity as to enable the needs at the graduate level to be met. They should bear in mind that more medical students from Maryland will be needed in the years ahead, that more Ph.D. candidates will be needed, and that the quality of such students can be improved upon.

While we made no detailed analysis of undergraduate schools, a number of items suggest a probable crisis in higher education, and a possible crisis at a lower level, which should receive prompt attention by trustees and planning bodies:

1. A recent study of Ph.D. candidates revealed "that the physical sciences and social sciences are the outstanding fields at the higher ability levels, followed closely by the arts and humanities, with the biological sciences and education lagging far behind. . . . Whatever the reasons for these differences, it is apparent that the fields of biology and education have not been able to attract their proportionate share of individuals of highest intelligence, as intelligence is judged from high school intelligence test scores. As the problems in these fields are certainly inherently as challenging as those in the physical sciences or social sciences, it might be inferred that there is a failure somewhere, probably at the high school level or even earlier, to present these challenges adequately to the bright young people who eventually attain doctoral degrees".* (We would include an additional probable cause for failure—the programming at the undergraduate level.) This finding is supported by the experience of medical schools which have generally felt

* Lindsey R. Harmon, *High School Backgrounds of Science Doctorates*, appearing in *Science*, 10 March 1961, page 684.

that in recent years more and more of the better qualified students enter other professions. This is in part demonstrated by the fact that, percentagewise, fewer A students are entering medicine and more B students are being accepted. See Table 15.

2. The Harmon study also revealed that "only one person in five attains the doctoral degree. There is thus a substantial reservoir of under-developed ability, regardless of the level of ability one assumes to be requisite for Ph.D.-level training, and even when we grant that not everybody at the highest ability levels needs a doctorate to complete his education".*

3. Few colleges in Maryland can boast that a significant number of their graduates went on for their Ph.D.'s, as the table in Appendix V shows. Some of these schools are of course very small, some are specialized, some are all female (and in our society the female is usually and unfortunately not encouraged to enter professional careers). The table is indicative of relative academic strength, strength which could encourage students to go on to graduate study. It suggests the most likely areas for academic expansion and/or strengthening to supply the needed graduate students in medicine and the biological sciences.

Finances

Financial aid is central to the problem in medical education. Lack of funds is perhaps the major deterrent for many who would otherwise apply to medical school and in time graduate and later make outstanding contributions through medicine.

The proposed federal legislation could be the most significant factor for alleviating the financial deterrent to the study of medicine.

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* Ibid., page 681.

Table 15

College-Grade Average First-Year Medical Students	1950-1951 %	1957-1958 %
3.6-4.0 (A)	40	18
2.6-3.5 (B)	43	66
1.0-2.5 (C)	17	16

During the same period the number of medical school applicants "represented as percentage of college graduates" dropped from 5.1 in 1950 to 4.1 in 1958.

Source: *Datagrams*, Vol. 1, No. 1, Association of American Medical Colleges, July 1959.

(See Appendix VIII) In the event that the requested funds are not forthcoming, complementary state programs would be in order. The deans of our two medical schools should jointly prepare a proposal for State aid.

It should be clearly recognized, however, that state government participation in medical scholarships should only be in the form of sums allocated to the medical schools for award by, and in the judgment of, the school or its trustees. Since both medical schools are meeting state as well as national needs, both should partake in state scholarship programs. Use of funds should not be restricted to Maryland residents, nor should Maryland residents matriculating outside of Maryland be excluded.

Additional sources for scholarship and loan funds should be tapped by the respective schools. We would emphasize "additional sources," not sources in place of state and federal programs. Two such sources are the graduates of each medical school and industry, and in particular those industries in the health fields. The latter should have a particular interest in assuring the nation of an adequate supply of physicians: not only does industry need physician services, including their research output, but also must be assured that their workers will always have adequate medical care.

Race

The potential of our large Negro population should be more effectively employed in order to meet our national and international needs.

The educational programs in primary and secondary schools and in our colleges—particularly in predominantly Negro colleges—need substantial strengthening. The failure to develop Negro physician potential, however, does not rest solely at this door.

Negro students are frequently not admitted to medical schools as a matter of policy. Though this situation is improving, and most noticeably in Maryland, all medical schools are under an obligation to divorce their admission processes from racial consideration. The need for physicians is too acute to allow for the aborting of our efforts by irrelevancies.

There are other factors which must be surmounted if we are to attract qualified Negroes into medicine. There are two major deterrents at this time:

1. Internships and residencies are reported as frequently unavailable to Negro physicians. This limitation is generally accepted as pronounced in Maryland.*
2. Hospital medical staff privileges for qualified Negro physicians are also not readily available.** While hospitals need to maintain quality, as well as a balance between the number of available beds and the number of doctors on the staff, the almost virtual exclusion of Negro physicians from medical staffs in Maryland is a cause of concern. Without adequate staff privileges Negro specialists have great difficulty meeting their continuing medical education needs, and are forced by economic circumstances to devote some time to general practice. Neither factor is conducive to the development of greater expertise in their specialty. It further deters talented Negroes from entering medicine.

Overcoming these problems is a far from simple task since many different people and organizations are involved, as well as community attitudes. Each of the concerned people and organizations must meet their leadership responsibilities in this matter in the immediate future. Without the exercise of leadership by these groups, progress will be difficult:

1. Hospital trustees, as the duly constituted governing bodies *and* appointing authority for staff privileges.
2. The Hospital Council, as the association established, in part, "to serve as a forum for the discussion of problems common to hospitals" and "to work constructively with other agencies concerned with the improvement of health and related social problems." (Articles of Incorporation)
3. Medical staffs in hospitals, who usually *recommend* to the trustees which of their professional colleagues should be granted staff privileges.
4. Medical and Chirurgical Faculty, as organized medicine's association established, in part, "to extend medical knowl-

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* See *Report of the Governor's Commission on Provident Hospital, 1960; Report of the Northwest Hospital Study Committee, 1961; The Sun,* June 4, 1961.

** Ibid.; also, *General Hospital Facilities for the Baltimore Area,* op. cit., 1958.

edge and advance medical science; to elevate the standard of medical education, and secure the enactment and enforcement of just laws relating to the practice of medicine and the public health; to foster friendly intercourse among physicians; and to enlighten and direct public opinion so that the profession shall become more useful in the prevention and cure of disease, in prolonging and adding comfort to life and in promoting a satisfactory distribution of medical care to the citizens of Maryland." (Constitution)

5. State Department of Health, as the purchaser of hospital services for the indigent and medical indigent, as a key agency in the allocation of Hill-Burton funds, and as the agency whose legally assigned function (Art. 43, Section 1b) is to "have care of the health interests of the people of this State."

To facilitate the process toward equal opportunity the State Department of Health, again in partial fulfillment of its legal responsibility for the public's health, should call together representatives from each of these groups to discuss the problem collectively, and to issue a joint report as soon as possible on action that is contemplated.

CHAPTER SIX

PHYSICIAN DISTRIBUTION

Conclusions and Recommendations

Conclusions

1. A full time physician located in every community is not essential or practical so long as a physician is within an hour's driving time.
2. Augmented postgraduate medical education programs, under medical school sponsorship, can make medical practice in rural areas more attractive.
3. Some medical specialities do not have enough physicians in them. Advances in medical science and changes in the mode of practice will constantly cause adjustment within specialties as to the number of specialists needed and available.

Recommendations

1. Small communities should explore the opportunities for part time physician offices.
2. Postgraduate medical education programs under medical school auspices should be encouraged, particularly in areas remote from the medical schools.
3. Medical schools should encourage young physicians and medical students to enter those specialties in which there is a shortage.

Physician Distribution—Discussion

The distribution of physicians within geographic areas and within specialties accounts for most of the reported physician shortages. Solutions to the maldistribution problem have geen generally unsuccessful.

Geographic Distribution

Among the factors known to influence the choice of a place of practice are: demand for medical services, location of the medical college attended, place of residence before entering

medical college, place where internship and/or residency was served, the methods and quality of transportation and communication, ready accessibility of hospital and consultation facilities, climate, availability of good schools, and many other personal, social and economic factors.*

Later on in this study of *Trends in Medical Practice*, the authors point out that

> The proportions of 1950 graduates in private practice in the various sizes of community may be compared with the proportions of the total population located in these communities:

Size of Community	Percent of 1950 Medical Graduates	Percent of 1950 Total Population
All sizes	100	100
500,000 and over	18	18
100,000-499,999	20	12
25,000- 99,999	20	12
5,000- 24,999	23	13
Under 5,000	19	45

> For each size of community, except that under 5,000 population, the proportion of 1950 medical college graduates was as large or larger than the proportion of the total population. The smallest communities received less than half the proportion of 1950 graduates than they had of the total population.**

Weighing these points we can gain some insight as to why physician shortages exist in some communities. While all are important, two need special attention: demand for medical services; ready accessibility of hospital and consultation facilities.

We must recognize at the outset that the young physician has just completed a rigorous training in highly scientific surroundings. He would be somewhat, and justifiably, reluctant to divorce himself from his colleagues, from the facilities and services in general hospitals, from the continuing educational processes so essential to modern medical practice, and from the fast moving pace to which he had become accustomed during medical school and internship. Rural practice, in communities under 5,000, is therefore not inviting to the new general practitioner. It is in such areas that the greatest shortages exist.

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* Weiskotten, et al.: *Trends in Medical Practice*, Journal of Medical Education, Dec. 1960, page 1083f.

** Ibid., page 1088.

The Maryland state medical society reported in late 1960 that there were 13 known openings for physicians in private practice, and that 9 of these were in general practice. Data concerning these openings are significant. See Table 16.

Most of the general practice openings are in rural communities. Many of these communities may have been accustomed to a physician from the time when transportation to larger communities was more difficult. Now, however, most of these communities are within 20 or 30 minutes of more populous areas. One could well question whether these small rural localities could keep a physician occupied full time, and provide the requisite financial support to attract and to maintain him—recognizing that the new physician is generally 30 years old and heavily in debt. Similar points can be made for many of the larger communities which desire specialists: do they really have enough work for them; can they support one?

This is not to suggest that the people in these communities do not need general practitioners and specialists. The people undoubtedly need such care. But it would appear that professionally and economically they may not be able to support such a physician full time, and that the solution is not to persist in trying to recruit *a* physician but rather to explore other means of meeting the public's need. All too often, however, the solution is that of continuing to seek a full time physician, and without long-term success.

Table 16

Location	Specialty Desired	Doctors Presently in Community *	Population	Distance to Nearest City
Hebron	GP	0	754	Salisbury — 7 mi.
Smith Island	GP	0	688	
Crisfield	GP & some anesthesia	4	3,540	Salisbury —34 mi.
Church Hill	GP	0	263	Chestertown—6 mi. Centerville —8 mi.
Vienna	GP	0	420	Salisbury —16 mi. Cambridge —13 mi.
Hurlock	GP	0	1,035	Cambridge —13 mi.
Mardela Springs ..	GP	1 (age 75)	380	Salisbury —10 mi.
Parsonsburg	GP	0	500	Salisbury — 8 mi.
Baltimore City ...	GP	1,431	920,700	—
Cumberland	ENT	59	33,415	—
Cambridge	Orthopedics Anesthesia Ophthalmology	18	12,239	—

* In private practice

This, then, is a geographic distribution problem. It exists all over the nation. Sound solutions are difficult to find, and some are not always palatable. In this country states have often sought to restrict the state medical school enrollment to state residents on the assumption that this would solve the problem. It has not. Other states have provided student loans and scholarships with a string attached: required service for a period of time in rural practice. This, too, has not been successful. In both approaches states have tried to provide full-time physicians where the need for full-time physicians may not exist. Some communities have built hospitals and medical centers with moderate success, but here the cost to small communities may be extremely high.

The problem is not peculiar to this nation. It exists all over the world, and there, again, are no hard and fast solutions. Dr. Karl Evang, Director-General of Health Services for Norway, writes: *

> Distribution of practicing physicians over the country as a whole is not all it should be. General practitioners are not such a problem, since the public health doctors go into every health district far and near, and they are also in active practice. But it is worse with private specialists. They tend to cluster in towns and cities where experts in various fields are already available at the hospitals, leaving large more thinly populated areas without any specialists at all. The Directorate of Health Services is making a great effort to improve this situation, among other things experimenting with traveling specialists who follow a regular schedule from one isolated community to another, testing and treating cases sent to them from the surrounding districts by the general practitioner in charge.

There are some steps which can be taken to alleviate the situation in Maryland.

First, some of our communities must recognize that with modern means of transportation, a 30 minute automobile drive is not unreasonable. A full-time physician in every hamlet is a luxury that neither they nor the nation can afford.

Second, small communities should explore the opportunities for part time physician offices, whereby the physician may hold office hours one or two days a week. In some localities this may require a guaranteed income and, in places like Smith Island, heli-

* Dr. Karl Evang: *Health Services in Norway,* Published by the Norwegian Joint Commission on International Social Policy, Oslo 1960, page 34.

copter service. It might be noted in this regard that federal funds are available under the Hill-Burton Act for the construction of community health centers which could be utilized in part for physicians' offices.

Third, specialist care might also become available to communities on a part time basis, with the specialist on a regular schedule.

Fourth, augmented postgraduate education programs, under medical school sponsorship, can appreciably make practice in nonmetropolitan areas more attractive. Places like Cumberland, Hagerstown, Frederick, Easton, Cambridge, Salisbury, Westminster, Bel Air, and Annapolis can become decentralized medical education centers under the aegis of a medical school. Besides encouraging physicians to locate in these areas, the programs can have a most salutary effect upon the continuing education requirements of physicians in practice.

Specialty Distribution

Physician shortages exist within some specialties. Alleviating these shortages, however, is by no means a simple task. The decision by a medical student or intern to enter a given specialty may be prompted by many factors. Some of the known factors are—the influence of a medical school faculty member, wife, or friend; the intellectual challenge; the certainty, or lack of certainty, of benefits to patients; the prestige of the specialty; the need to earn an early living; the knowledge about, and extent of acquaintanceship with, the specialty.

The personal nature of many of these motivating factors suggest that, at best, we can only attempt to influence the direction of specialty selection. In the not-so-personal areas, however, rather effective measures can be taken.

A key area for effective influence is in medical school. Dr. Helen M. Wallace argues * that "it would appear logical . . . that the faculty of any medical school . . . has a responsibility in bringing to its students early in medical school information regarding those fields of medicine in which there is a marked shortage of personnel and in which there is a current great demand for trained

* Wallace, Dr. Helen M.: *Medical Manpower in Physical Medicine and Rehabilitation,* Journal of Medical Education, December 1960, page 1144.

physicians. Furthermore, it would seem desirable at the time this step is taken, and subsequently, to provide medical students with an opportunity to become well acquainted with the full-time faculty members in those fields which have an acute shortage of personnel."

The comparatively new specialty of physiatry is a case in point. In Maryland today there are only 5 physiatrists. In 1958-59, nationally, only 57% of the total residency appointments in Physical Medicine and Rehabilitation were filled (143 out of 249). In addition, Dr. Wallace relates * that in a study of medical school student hours, "the field of physical medicine and rehabilitation had the lowest number of average student hours of any field of medicine" and "data on hours in physical medicine and rehabilitation were reported by only 34 medical schools." See Table 17.

Commenting on this shortage of personnel in its recent report, the Subcommittee on Chronic Illness states: **

> This can be accounted for both by the newness of rehabilitation medicine and by the lack of information concerning rehabilitation on the part of the medical, hospital, and allied

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* Ibid., page 1146.

** *Comprehensive Medical Rehabilitation Programs for Maryland,* Subcommittee on Chronic Illness, Committee on Medical Care, Maryland State Planning Commission, August 1961.

Table 17

SCHOOL REPORTS OF STUDENT HOURS REQUIRED EACH YEAR IN VARIOUS CLINICAL SPECIALTIES

Discipline	Totals	
	Av. No. Hours	No. Schools
Medicine	902.2	58
Surgery	573.8	57
Pediatrics	378.9	69
Psychiatry	231.9	68
Obstetrics	229.2	66
Gynecology	188.4	65
Preventive medicine	121.6	65
Neurology	84.1	58
Orthopedics	79.0	58
Urology	62.8	57
Radiology	57.3	62
Dermatology	54.0	63
Ophthalmology	47.7	64
Otolaryngology	44.3	63
Anesthesiology	39.5	62
PM and R	35.5	34

Source: H. H. Gee, and J. B. Richmond, *Report of the First Institute on Clinical Teaching.* J.M.Educ., 34 (part 2): 192, 1959.

professions. The medical profession, in this regard, has a responsibility for teaching comprehensive medicine in graduate and undergraduate programs.

Dr. Wallace's call to the medical schools to seize the initiative in this regard would apply to other specialties in which shortages exist. It is generally acknowledged, for example, that medical schools do not give much attention to public health. This, no doubt, in part accounts for the fact that nationally, in 1958-59, only 36% of the total Preventive Medicine and Public Health residency appointments were filled (32 out of 88). Public health, of course, is not a new specialty, though its scope has broadened considerably in the past few years. In Maryland, for example, the public health physician has a far more challenging role in that he is responsible for not only the traditional preventive services but also for treatment services.

Psychiatry is another example of a specialty in which the medical schools can play a significant role in affecting student decisions on field of concentration. While it is true that the total student hours in psychiatry stood fourth, following medicine, surgery, and pediatrics, the specialty of psychiatry ranks 11th on the prestige scale of medical school faculties. See Table 18.

With a low prestige, the effectiveness of efforts to get additional interest in this specialty cannot help but be diminished. Psychiatry, of course, still suffers from the days when its theories and methods were far more imprecise than at present. This in part accounts for

Table 18

STUDENT AND FACULTY RATINGS OF PRESTIGE OF SPECIALTIES

Specialty	Ranking by Students	Ranking by Faculty
Surgery	1	1
Internal medicine	2	2
Neurology	3	3
Pathology	4	5
Pediatrics	5	7
Obstetrics	6	4
Radiology	7	7
Ophthalmology	8	7
General practice	9	10
Otolaryngology	10	9
Psychiatry	11	11
Dermatology	12	12

Source: G. G. Reader, *Development of Professional Attitudes and Capacities.* J.M.Educ., 33 (Part 2): 164-85, 1958 (18).

the attitude of faculty members. Our need for psychiatrists, however, is sufficient to prompt a reappraisal of attitudes by individual members of all medical school faculties. The departments of psychiatry can do much to assist in such reappraisals.

There are some additional factors which will in the future materially affect the distribution of physicians within specialties.

One of these factors is the growing trend toward physician offices at, or adjacent to, general hospitals. The physician who has to travel several miles a day between the hospital and his office loses time. Those who have seriously ill patients in the hospital, or obstetricians with women in labor, often have to cancel office appointments. When their office is at the hospital or "across the street" they can more easily fulfill their office commitments while still available when necessary to their hospital patients. As more specialists move closer to their hospitals their efficiency, and hence case loads, can increase, and the need for more specialists within that specialty lessened. This, then, can serve to channel new physicians to other specialties.

Another factor is the likely advent of vaccines for the adenovirus diseases and for measles. These conditions, with their complications, are heavy users of physician services. With vaccines, any current or future shortage of pediatricians and general practitioners will be lessened. This will encourage new physicians to enter other specialties.

A third factor is the increased use of ancillary or para-medical personnel. The armed forces pioneered in this area, learning to use carefully trained personnel under medical direction. There are many areas in which this practice can be broadened throughout medical practice. It can alleviate, in some degree, the shortage of physicians in certain specialties. The advantages to be derived from this approach will probably be realized most in those instances where group practice is in effect.

A fourth factor relates to the Negro physician. Until Negroes are assured of hospital staff privileges when they become qualified, they will not be encouraged to enter medicine and, in particular, to enter a specialty. This has been discussed in Chapter Five.

CHAPTER SEVEN

POSTGRADUATE MEDICAL EDUCATION AND THE MAINTENANCE OF QUALITY

Conclusions and Recommendations

Conclusions

1. Participation by all physicians in postgraduate medical education programs is a *sine qua non* for the maintenance of quality in medical care.
2. Maryland has had for many years unusually extensive postgraduate medical education opportunities for physicians.
3. There are areas in which our postgraduate medical education opportunities can be advantageously strengthened.

Recommendations

1. Increased opportunities should be provided to all physicians for bedside postgraduate instruction, preferably in community hospitals, under the auspices of the medical schools. This would entail bringing more hospitals into affiliation, or just closer relationship, with the medical schools, a development which should be encouraged. Furthering this objective should be the responsibility of the physicians in charge of the postgraduate medical education programs at the University of Maryland and The Johns Hopkins University schools of medicine.
2. Close professional relationships should be established between the house officers of teaching hospitals and the physicians who refer patients to these hospitals. These physicians should regularly be invited to observe the care of their patients, to discuss with the responsible house officers problems involved in their medical care, and to participate in rounds and conferences in which their patients are involved.
3. Government programs in local health departments and in institutions should be suitably coordinated with the graduate and postgraduate educational programs of the universities.

4. The State should look with favor to the support of experimental projects in graduate and postgraduate medical education, for the very reason that such education is essential for maintenance of high standards and quality in the care provided.

Postgraduate Medical Education—Discussion

The education of a physician is perhaps the most prolonged of all professions. Two to four years of pre-medical studies are required for admission to all medical schools. Then, upon completion of four years in medical school, the degree of Doctor of Medicine is granted. But this is by no means the end of the educational process. There is yet the one year internship and, for most physicians today, a two to three year period of residency training in some specialty. The formal educational process thus accounts for at least nine years, and quite often twelve years, for most new physicians.

One of the marks of a profession, however, and of a professional man, is acceptance of the need for continuing education. Acceptance of this is essential for the practice of good medicine. The development of new techniques and the articulation of new knowledge are being made with such rapidity that the physician today must remain in the educational process until he retires from practice.

Thus, the school years, the internship, and the residency constitute the formal period. Beyond—in the postgraduate or continuing education area—the integrity of the physician as a professional man comes more into play.

Our purpose in this section is to consider some of the means by which the medical profession has sought to impart to its members the current knowledge so essential to the rendering of good medical care.

The American Medical Association's Council on Medical Education and Hospitals cites as the objectives of postgraduate (continuing) medical education: *

> The ultimate aim of postgraduate medical education is to make it possible for each physician to use in his practice the

* *A Guide Regarding Objectives and Basic Principles of Postgraduate Medical Education Programs,* prepared by the Council on Medical Education and Hospitals of the American Medical Association, adopted by the House of Delegates June 1957, page 5.

modern medical knowledge that continuously becomes available. Adequate professional growth ensues through the participation of each physician in suitable programs of continuing education in addition to his own experience and reading.

Postgraduate educational programs should as a result of current advances in the basic science and clinical fields favorably augment and modify an adequate initial education. These programs should make possible the acquisition of such new skills in the field of original competence as scientific advances require. All continuing education should strengthen the habits of critical inquiry and balanced judgment that denote the truly professional and scientific man.

Continuing educational opportunities are available in many forms, the more common of which are:

1. medical literature
2. local, state, and national meetings of general and specialty medical societies
3. hospital staff meetings and conferences
4. formal postgraduate courses at medical schools and teaching hospitals
5. regional institutes conducted by medical school staff in locations remote from the school
6. affiliation with a teaching hospital
7. participation in medical research.

No one of these approaches can be cited as the *be all* and *end all* of continuing medical education. Each has its advantages, each its disadvantages. Commenting on the first and second items, the A.M.A.'s Council on Medical Education and Hospitals states: *

> The enormous and increasing bulk of medical literature on even relatively restricted subjects makes difficult the maintaining of current knowledge by this means alone. The routine medical society meetings are often of necessity not primarily educational.

The same might be said of hospital staff meetings and conferences (#3), the attendance to which was once required by the national accrediting body but is now left to the rules of individual hospital

* Ibid., page 3.

medical staffs. These observations, of course, refer to the national scene. Locally there are always exceptions. In Maryland, for example, some of our medical societies, such as the Baltimore City Medical Society, have a long and continuing history of outstanding educational programs. Some of the large hospitals, moreover, continue the primary emphasis of education at staff meetings. The relative decline in the hospital staff and medical society meeting as an education forum, however, stems from the fact that other demands are being made upon the staffs and societies, as well as from a realization that the lecture method, which perforce the societies and medical staffs must use, is of limited value. The lecture system needs to be supplemented by programs that provide for the active participation of the learning physician.

> The educational methods should include more than a series of lectures or panel discussions in which the physicians are primarily passive recipients. Methods requiring active participation include live clinics and bedside rounds, seminars, open question periods, laboratory work, and study of patients under supervision.*

In concluding its discussion of postgraduate medical education, the A.M.A.'s Council on Medical Education and Hospitals says: **

> The basic principles of postgraduate medical education are the same as are those of undergraduate and graduate medical education. In addition to students, an effective program requires leadership, careful planning, suitable facilities, and effective teachers who use dynamic methods of education that enlist the participation of the student. For too long, the methods and facilities found lacking 50 years ago for effective undergraduate medical education have continued to be employed in many postgraduate courses and in some other activities labeled as educational for physicians.

Maryland physicians are fortunate in having a wealth of formal postgraduate medical education opportunities available to them. Their good fortune stems from the fact that there are two medical schools within the state, three medical schools in Washington, D. C., and five medical schools in Philadelphia. Each of the schools offers different postgraduate courses each year so that over a period of years the major advances in medicine are covered. The

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* Ibid., page 11.
** Ibid., page 15.

courses available through the Maryland schools this year appear in the appendix. (Appendix IX) Physicians frequently journey greater distances, however, to study under particular people and to study particular subjects which may not be offered in this area during the current year. To appreciate the available opportunities nationally we might note that the annual listing of available courses takes up 53 pages in the Journal of the American Medical Association.*

Increasingly, however, medical schools are not relying upon the practicing physicians coming to them. Programs are being conducted in areas removed from the schools by representatives of the schools. In Maryland, for example, the University of Maryland School of Medicine is conducting organized postgraduate programs in Frederick, Hagerstown, Easton, and Salisbury. The value derived from well organized postgraduate programs is such that their extension should be encouraged. It should be recognized, however, that this type of community service by the medical faculties requires that they be staffed in greater depth than would be needed if the faculties were engaged only in research or intra-mural teaching.

Affiliation with a teaching hospital is perhaps one of the most effective ways to meet one's postdoctoral educational needs, for the teaching hospital provides a constant educational environment. How good the environment is, however, will depend upon the conscientiousness of the staff in fulfilling its responsibilities to teach, for the teaching hospital is committed to the education of interns and residents. The instruction is handled either by members of the attending staff on a volunteer basis or by physicians who are full time employees of the hospital. In case of the latter, the attending staff generally assists in the educational program. Commenting on the efficacies of a teaching hospital the Council on Medical Education points out: **

> It is generally considered that the attending staff of a hospital in its contacts with interns and residents in an approved program stimulates and educates the resident staff. It is also true that the intern and resident staff coming recently from the research and teaching ferment of a medical center can stimulate and inform the attending staff of a community hospital. Such a two-way exchange of ideas and mutual ignition of

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* JAMA, Vol. 173, No. 15 (Aug. 13, 1960), pages 1670-1723.
** Op. cit., page 9.

curiosity is implicit in any effective graduate educational program. It is at times difficult to delineate clearly whether the graduate or postgraduate medical education implications are the greatest in various features of some of the existing and experimental ventures between regional hospitals and medical schools. The benefit to the attending staff is directly related to its wholehearted participation in the various conferences, ward rounds, and other activities of the program.

Generally speaking, the teaching hospital with full-time staff members is able to conduct stronger educational programs because the staff can devote most of their time to teaching. The programs in teaching hospitals can be further strengthened by affiliation or a close relationship with a medical school. It should be recognized, however, that as a hospital is committed to a teaching program, many staff members feel that their freedom is threatened. This often stems from a misunderstanding as to the objectives of the teaching program, and sometimes from disagreement with the manner in which the objectives have been presented to them.

Postgraduate education of practicing physicians is, of course, most effective when it concerns directly the physicians' own patients. Physicians who refer patients to teaching hospitals could profit enormously by observation of the diagnostic and therapeutic procedures, by discussions with the house officers caring for their patients, and by attendance at the rounds and conferences at which their patients' problems are discussed. Teaching hospitals could make a very significant contribution to postgraduate education if the house officers were instructed to maintain contact with referring physicians, to make these physicians feel welcome on the hospital wards, and specifically to invite them to the rounds and conferences at which their cases are being discussed. At the present time this type of relationship does not exist between referring physicians and the teaching hospitals. For this reason there is at times a certain amount of antipathy between the referring physicians and the hospital to the disadvantage of both the physicians and the hospitals.

Participation in medical research is the final item which we shall consider as a means of continuing education. The value in medical research stems not so much from what the person may learn about a given field in which he is studying—though this may be significant—but rather from his gain in the research outlook of inquiry and objectivity. The desire for excellence in research

strengthens the basic intellectual approach which one needs in seeking to keep abreast with the latest developments in medicine.

Maryland for many years has been rich in its medical education opportunities. Progress which has been made is indeed worthy of commendation. It must be remembered, however, that participation by all physicians in postgraduate medical education programs is a *sine qua non* for the maintenance of quality in medical care. There are areas which can be strengthened, and to these we have alluded in this discussion:

1. Increased opportunities to all physicians for bedside postgraduate instruction in community hospitals, conducted by medical school staff members, would be advantageous. One approach to this would be the encouragement of regional institutes such as the program conducted by the University of Maryland in Frederick. Progress toward this objective could be made if the physicians in charge of postgraduate medical education at each medical school were responsible for its development. This may entail bringing more hospitals into affiliation, or just closer relationship, with the medical school.

2. Close professional relationships should be established between the house officers of teaching hospitals and the physicians who refer patients to these hospitals. These physicians should regularly be invited to observe the care of their patients, to discuss with the responsible house officers problems involved in their medical care, and to participate in rounds and conferences in which their patients are involved.

There are in addition some relatively untapped resources which might be effectively marshalled in our medical education efforts. We refer to the developing programs within local health departments, as well as the institutional services provided by the State through its mental hospitals, chronic disease hospitals, tuberculosis hospitals, and institutions for the mentally retarded; also, the federal programs in the Veterans Administration and Public Health Service hospitals. These programs contain vast clinical resources and employ able staff and consultants. If suitably coordinated with the graduate and postgraduate educational programs of the universities and their regional institutes, many benefits could accrue to the physicians who are in active practice and on the staffs of the institutions.

The importance of graduate and postgraduate medical education is so great that experimental projects should be encouraged to explore new ways of making our efforts more effective. The State should look with favor to support of experimental projects in graduate and postgraduate medical education.

CHAPTER EIGHT

MEDICAL RESEARCH AND MEDICAL EDUCATION

Conclusions and Recommendations

Conclusions

1. While social and economic losses due to illness and injury can be minimized by adequate health and medical care programs, major changes in this loss experience both to the state and to the individual will chiefly be obtained through improvements in medical knowledge and capabilities gained through research. Medical education thus becomes inseparable from medical research.
2. State government, in assuming responsibility for certain diseases, takes under its control most of the clinical material which would serve as a basis for teaching and research in those disease categories. This places an obligation upon the State to use this material and to make it available to others, for research and education purposes.
3. The monies available from federal and private sources for research purposes have increased greatly in the past twenty years.
4. Opportunities for research and medical education on the part of professional personnel would make State employment more attractive, and provide a stimulus which can have a healthy effect upon the therapeutic process.

Recommendations

1. The State of Maryland should provide its respective institutions with adequate facilities in which to carry out research projects financed principally by grants.
2. The State of Maryland should staff each health agency and each of its research facilities with a continuing core group of qualified personnel to provide direction and continuity in the development and conduct of research activities. Further augmentation of the core groups for specific projects should not be a State responsibility except in those areas which have a special and unique relevancy to the state.

3. The State of Maryland should continue to allow the medical schools and teaching hospitals access to State institutions and programs for medical education and research purposes.

4. Professional personnel in the departments of Health and Mental Hygiene and other medical agencies should be allowed reasonable time for research and other medical education activities. Teaching appointments at medical schools and at schools of hygiene and public health should be encouraged.

Medical Research and Medical Education—Discussion

Support for medical research from federal and non-federal sources has greatly increased over the past 20 years as Table 19 indicates.

It is at the universities and teaching hospitals that the greatest sums are concentrated, and in particular at the medical schools. The reason for this concentration is simply understood: teaching and research go hand in hand. The latter provides the stimulus, the essential evaluation of work being done, and the facts for the expert communication of knowledge. This is not to say that all researchers are good teachers or that good research cannot be conducted outside an educational institution. It is a simple statement of fact that,

Table 19

TOTAL, FEDERAL, AND NON-FEDERAL MEDICAL AND HEALTH RELATED RESEARCH EXPENDITURES, 1940-61

(In Millions)

	Total National Medical Research	Non-Federal Medical Research	Federal Medical Research	Federal as Percent of Total National Medical Research
1940	$ 45	$ 42	$ 3	7
1947	88	60	28	32
1950	148	88	60	41
1953	203	107	96	47
1954	225	118	107	48
1955	240	122	118	49
1956	285	150	135	47
1957	397	211	186	47
1958	491	264	227	46
1959	587	296	291	50
1960	715	335	380	53
1961 (estimated)	890	394	496	56

Source: U. S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, Office of Program Planning, Resources Analysis Section (May 1961).

by and large, the atmosphere of an educational institution provides the desired milieu for good research.

The inseparability of medical education from medical research is borne out by cost analyses of medical school budgets. These analyses, being conducted by the individual medical schools for the Association of American Medical Colleges, are reported to indicate generally that for a well rounded medical school program approximately 20-25% of the budget goes to educate the medical student, 15-20% to graduate and postgraduate medical education, 30% to patient service, and 30% to medical research. These relative percentages, it should be carefully noted, are cost allocations for undissociable parts of a total program in medical education.

The role of state government in support of medical research has always had some ill-defined aspects, and it is to these points which we shall direct our attention.

State Support of Medical Research

The wealth of funds available from foundations and the federal government for medical research suggests that state government should not embark upon any broad program to support specific research projects. (We would not, in this regard, classify demonstration projects as research, though they are often referred to as such.) There are, of course, exceptions to this general statement on research, and these are in those areas where the project to be studied has special and unique relevancy to the state. In Maryland such studies might relate to the seafood industry, water pollution, etc.

This does not, however, absolve the state from responsibility in the research area, for the state, in assuming the responsibility of caring for certain diseases, takes under its control most of the clinical material which would serve as a basis for research and for medical education in those disease categories. This places an obligation upon the state to use this material, and to make it available to others, for research and education purposes. Otherwise, definitive research and teaching in the prevention and cure of these diseases is seriously limited. The state has an economic and social interest in both objectives. The economic loss is especially significant, for illness and injury lead to unemployment, reduced personal income, and reduced state income. While these losses can be minimized by adequate health and medical care programs, major changes in this experience will mainly be obtained through improvements in

medical knowledge and capabilities gained through research. The effect of research is illustrated by Maryland's experience with tuberculosis during the past ten years, a period in which great research efforts were made. There has been approximately a 25% decline in the number of State tuberculosis hospital beds at a time when the state's population increased by 32.3%.

The State's proper role in research should be to provide its respective institutions with the facilities in which to carry out the research projects which are supported principally by grants. The State's proper role should be to staff each health agency and each of its facilities with a continuing core group of qualified personnel to provide direction and continuity in the development of research activities. These core groups should be sufficiently strong to handle a variety of research projects. Further augmentation of the core groups for specific projects should generally not be a State responsibility (except for studies which have special relevancy to Maryland) but should be financed out of project grants. Finally, the State's proper role should be to continue to allow the medical schools and teaching hospitals access to the State institutions and programs for medical education and research purposes.*

Access to State programs and institutions by the medical schools and teaching hospitals requires some elaboration. Such access should be accomplished in a spirit of cooperation, though based upon a carefully prepared plan to which the State facility agrees, for the gain is not only by the medical school and teaching hospital. They acquire, to be sure, access to clinical material otherwise not available. But on the other hand their very presence in the State facility should provide a stimulus to its staff. While it is to be expected that the teaching and research programs from the outside would be conducted with all the ethical, legal, and scientific practices that are generally accepted for clinical investigation, it should be borne in mind that it may be necessary to allow therapeutic methods not normally employed by the hospital or other health program. In addition it should be recognized that once research studies are initiated by a medical school or teaching hospital, that research project should have complete and undivided access to the specific clinical material under its study. It must have this if it is to maintain control of the project and its results.

* Similarly, the medical schools and teaching hospitals should have appropriate access to the federal hospitals for medical education and research purposes.

Time Allocations to Medical Education and Research by Health and Mental Hygiene Personnel

Professional personnel, both medical and para-medical, in the departments of Health and Mental Hygiene (and other medical agencies) should be permitted a reasonable amount of time for research and other medical education activities. Teaching appointments at medical schools and at schools of hygiene and public health should, in particular, be encouraged.

There are two principal reasons why this is desirable. First, in recruiting personnel, the best people insist upon such opportunities. It has been shown repeatedly that in the absence of such opportunities, positions in State service may remain vacant.* Second, professional personnel in State service have continuing educational needs in which it is in the State's interest to support. With the advance of medical knowledge, it is essential that State personnel be in a position to acquire knowledge and understanding of the latest developments so that they can be quickly made part of the therapeutic process in State programs.

* See *Neuropathologic Programs in Maryland,* Committee on Medical Care, Maryland State Planning Commission, May 1959, page 13f.

CHAPTER NINE

REPORTS FROM CONSULTANTS

The subcommittee submitted an early draft of its report to a number of national consultants. Extensive analyses were made by Dr. Willard C. Rappleye and Dr. Thomas Parran, both of whose critiques were of inestimable help to the subcommittee. Their analyses constitute the text of this chapter.

Dr. Rappleye's critique is printed in its entirety. Dr. Parran's report has been edited: deleted were those sections which no longer apply due to acceptance and incorporation of his suggested revisions.

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CRITIQUE OF REPORT ON MEDICAL EDUCATION

by

WILLARD C. RAPPLEYE, M.D.

It is a privilege to comment on the report of the Subcommittee on Medical Education and Research. The membership of that group, the consultants who participated in the study and the thorough review of the current literature have insured full coverage of the subject. In an effort to be helpful may I make some running comments on certain general features of the overall problems involved.

It is now widely accepted that the health services are a vital national resource which require new methods and efforts of a greater order of magnitude than have been employed to date. They rank with such other major phases of the economy as food supply, housing, employment, education, industry, agriculture and social security, with each of which they are closely related.

Medical education and the health services are challenged by many new and rapidly growing scientific, social and economic forces that bear directly on the activities of the medical and allied professions, the universities, the hospitals, industry, labor and all levels of government. The American people are convinced that adequate health services are essential in our society and are determined that "medical security" in some form shall be made available to the entire population. They are prepared to use their wealth through voluntary as well as governmental channels to attain the fullest possible measure of benefits.

To a considerable degree medical education, which is the only source of physicians, and medical research, which is its catalyst, are largely subject to influences outside of their control, particularly in regard to the recruitment of well-qualified staffs and students. One of the greatest challenges of our times is that of creating public understanding of, and sufficient financial support for, the invaluable contributions which science and professional education can make to the well being, comfort, happiness and safety of the nation and the extent to which we can help others elsewhere in the world to obtain those benefits.

The amount of money spent on medical education has remained at approximately one per cent of the total national expenditures for medical care. The latter have risen from $3.6 billion in 1928 to approximately $22.7 billion in 1958 and over $25 billion now. The percentage of the Gross National Product has gone from 3.7% to 5.2%. About 76% of all medical expenditures come from private sources and the balance of 24% from public expenditures. The total of the private outlay is roughly 5% of the current consumers disposable income.

There is growing concern that emphasis on the purely financial aspects of these problems fails to give proper consideration to the quality of services and the qualifications of the personnel that are to conduct the programs. No plan of organization, however efficient, can meet the needs unless the personnel in those plans are competent and well qualified.

To illustrate one of the major population changes, a new set of problems is confronting the country and medical services through the "younging" as distinguished from the "aging" of the population. The number of people under 20 years of age will reach 90,000,000 or 40% of the population by 1970. The importance of this develop-

ment will be in the electorate as well as in the fields of obstetrics, pediatrics, hospital services, public schools and other phases of community life. By 1970 those of 65 years of age or older (roughly 21,000,000) and those below 20 years of age (roughly 90,000,000) will represent over 50% of the entire population of the country.

A point of interest, also, is the nomadic character of our American society as witnessed by the fact that 33 million persons changed residence last year. This phenomenon has a bearing on any consideration of local state health programs since about 10 million of these individuals crossed state or county lines last year. These considerations are related to how medical services in the country are to be organized in the future since many people do not retain the long time services of a family physician when they move to another area. The conditions often prevent a doctor from following patients and families on the basis of the longitudinal concept of illness which involves the whole life span of an individual or family and gives due consideration to the hereditary, environmental, educational, economic, psychological and emotional aspects of health and illness and the further fact that in older age groups the problems are not so much those of diagnosis and treatment as they are of management, nutrition and psycho-social factors.

Another feature is not generally recognized. While it is true that life expectancy at birth has increased from 47 to approximately 70 years since 1900, the increase has been due largely to the control and prevention of the episodic diseases of infancy and childhood. The crippling and killing diseases such as cancer, heart and vascular disease, metabolic disorders and others which (with accidents) are now the chief causes of death are less susceptible to community control or prevention. Contrary to common belief, the life expectancy of persons over 50 years of age is now rising very slowly. In view of present known facts the average remaining lifetime at age 65 will be extended only about two years between 1960 and 1970 and only by four years between 1960 and 2000. The implications to medical services and facilities are numerous unless a noteworthy breakthrough occurs in regard to such major diseases as arteriosclerosis, heart disease and cancer.

The challenge ahead is not so much a matter of lengthening life but of making it more productive and satisfying. It is not a question of more years but of better years which is likely to become a major goal of medical science and health services in collaboration with the

social sciences, psychology and other fields during the next few decades.

One of the strongest features of the report is the emphasis that medical education and research are national in character and not limited to individual states. Graduates of medical schools migrate to all sections of the country. Each section, in turn, draws physicians and other health personnel from all other areas, including foreign.

The need for an increase in the output of physicians for the future needs of the country is generally accepted although too little attention is being paid to questions regarding the more effective utilization of the existing profession and the future additions that will be made to it. This is partly a matter of the distribution of doctors, governed so largely by economic considerations, public education, population shifts and many other factors which are brought out in the report. A number of the major communities have more physicians now than are really required if their services were effectively and efficiently utilized. Other areas of the country are or shortly will be in short supply.

There is a fundamental socio-economic-professional shift now in process relative to how physicians in the future will conduct their practices, how they will be organized and financed. Witness the fact that there are now about 132 million persons covered by prepayment hospital "insurance" and close to 90 million with some degree of coverage through prepayment for professional services. These are significant trends which are likely to continue, particularly in the development of state, municipal and Federal programs, labor union-industry plans and local community organizations for medical care.

It is interesting to note that about 25% of recent medical graduates in practice are on a full time salary basis, as an illustration. Over one-half of the residents in our present hospitals are desirous of remaining in some form of organized practice when they complete their programs.

One of the major considerations in the evolution of health services is the gradual transition from the long established methods of individual, solo private practice of medicine on a fee-for-service basis into methods more consistent with the recent developments in specialization within the profession, the growth of scientific knowledge, the requirements for extensive resources for the modern prac-

tice of medicine and the necessity of meeting the high costs of health service through various group and "insurance" devices which distribute the costs of health services over large groups of the population and for long periods of time. These developments in themselves introduce new problems arising from a change in the method of payment for health services from those who are or have been ill to those who are well and employed. The shift from the individual or family in distress to an organization of well people, whether governmental or voluntary, which decides in advance how its funds are to be spent has created an entirely new power in the health program of the nation.

If progress can be made in the better utilization and management of medical facilities, resources and personnel through functionally structured hospital services, ambulatory care, laboratory services, home care, nursing homes, public infirmaries and group practice that would increase the efficiency of health care by even five to ten per cent, which is quite conservative, the results could be equivalent to the output of perhaps 10 new medical schools and at great financial savings. Stress on other features of community health such as control of automobile accidents, which claim one out of every eight deaths of men under 45 years of age, diet control and proper nutrition, air and water pollution, industrial hazards and physical fitness programs, as illustrations, will have pronounced effects on the demands for medical manpower.

It is entirely possible that the ratio of 133 doctors per 100,000 of the population under future conditions may be liberal even for this country. It is now much higher than any other country except Israel. Consideration of the health needs of underdeveloped countries introduces another but not necessarily a large factor if this challenge is met realistically through direct support of medical facilities and staffs in the respective countries.

The ratio of physicians to population has been practically stationary for several decades although it has risen from 125 physicians per 100,000 people since 1930. In many sections of the country at that time neither adequate methods of transportation and communication nor modern medical facilities, paramedical personnel, hospitals and clinics, present day therapy and local health programs were as well developed as they are now. There was a time when it was almost necessary to have a doctor in each hamlet and village, almost one at every crossroad, because of the difficulties of trans-

portation and lack of communication. The radius of practice often was two or three miles compared with perhaps 30 miles today. This change is, of course, one of the reasons for the present concentration of physicians in larger communities, together with more satisfactory professional opportunities and associations, better schools and social life for the family.

During the last 40 years the number of physicians has increased 117% while the population has risen 76%. During the last decade the enrollment of medical schools has risen 22.8% while the population has increased 16.4%. Allowing for guarded interpretation of the data, it is of interest that in 1960 there were 8,030 additions to the medical profession, including 1,569 graduates of foreign medical schools. The reported deaths in the profession totalled about 3,700. The number of medical graduates from American schools was 6,860 last year compared with 2,529 in 1922.

What bothers a number of people in the discussion of the "numbers game" is the failure to consider fully the quality of physicians, instruction, teaching staffs and students. The emphasis needs to be placed more on quality and competence rather than number of physicians and other health personnel. The general current decline in standards and recruitment is widely acknowledged but quantitatively, at least, this situation may correct itself in five to ten years when the output of the colleges and universities of the country may be doubled. Some students of this problem are already seriously concerned with the prospects of excessive numbers of college graduates seeking employment within 10-15 years. Even at the present low ratio of about 2% of college graduates going into medicine, compared with 14% in 1900, the country should have a numerically sufficient future reservoir of college graduates seeking admission to medical studies.

A factor in the recruitment of high quality professional students is the reduction in the previously favored position of medicine. Today it is no longer the first choice of as large a proportion of students well prepared in biology, physics, mathematics and chemistry as in the past. Many industries are offering favorable opportunities, security, good financial return and careers to young men and women with the backgrounds most needed also for medicine and the health professions. There are growing opportunities in the areas of the social sciences, business and other fields with which medicine, in a sense, is in competition in attracting students. This

situation is likely to be important in the next decade even when large numbers of college graduates become available.

The recruitment of medical students in the future will depend more upon the challenges which medicine will offer for satisfying careers in science, graduate education, clinical opportunities and public service to well qualified and properly motivated college students than upon scholarships or other financial aid, necessary as they are. Strengthening career opportunities will be the greatest single incentive in the recruitment of medical students.

Since about 17% of physicians licensed to practice in the country currently are graduates of foreign medical schools, your remarks in several places that you think there is "no point for concern over our intake of foreign physicians" is worthy of discussion.* Some of the foreign medical graduates, particularly the small number from the better medical schools abroad, are well trained and competent and many of the others have high intelligence and eagerness to be taught, but the large majority of them now coming into the U.S. have a preparation far below the standards which are regarded as satisfactory. What actually is happening is that two classes of citizens have been created in this country as far as medical services is concerned,—the first comprising those who are cared for by physicians who have received a medical preparation of adequate standards and the second representing those who receive such services from doctors who have entered the United States with qualifications below those that have been developed in the American schools during the last 40 years.

The problem of the foreign medical graduates who are in this country on student visas is a somewhat separate problem since most of them are not licensed to practice and many come to the United States for reasons other than educational.

In the recent examinations of the Educational Council for Foreign Medical Graduates, 71% received either the standard certificate or the temporary (2 year) certificate. The large number who passed the tests indicates how ineffective is any system of examination alone in evaluating the educational preparation of a physician since most of the foreign graduates have not obtained a satisfactory medical education. The present methods of dealing with

* In later discussions the subcommittee concluded, on the basis of new data, that the intake of foreign physicians is a matter for grave concern. The quotation does not exist, therefore, in the final report.

this entire problem are not serving the best interests of those foreign medical school graduates, their own countries, the American hospitals or good international policy.

It is apparent that there is no gross shortage of physicians in Maryland today. You are not likely to have one because the output of your own schools plus the in-migration of medical graduates to the desirable areas of the country such as Maryland represents should give you little concern about your own future supply. As you have emphasized, however, your section of the country will be expected to contribute to the national needs because of the excellence of your institutions.

The inability of hospitals to obtain interns and residents is not an index of the need for physicians for the country if the internship and residency are to be regarded as an educational experience, as they should be. In the background of the present situation has been the rapid expansion during recent years of internships and residencies approved for educational purposes by the Council on Medical Education and Hospitals of the American Medical Association. In 1920 there were 3,420 internships recognized as satisfactory for the continuing graduate education of the 3,047 physicians who completed their medical courses in the United States that year. In 1960, there were approved internships in 856 hospitals and 7,081 graduates of American medical schools. The number of recognized internships has increased over 50% since 1941.

The approved residencies in 1940 numbered 5,256, double the total of a decade before. Following the War the number rose to 17,293 in 1948 and is now 31,733 in 1,307 hospitals, an increase of nearly 600% in two decades. The rapid growth of residencies is explained largely by the post-war expansion of programs for the benefit of returning servicemen, many of which were continued after the immediate needs were met. Other contributing factors include the increased demands for more adequate hospital care of patients, the better coverage of night and week-end services, the reduction in the average length of patients' stay, increased care for ambulatory patients, emergencies and private patients, the sudden pressure for advanced training in many clinical specialities to meet changing conditions of medical practice, the phenomenal advances in medical and surgical procedures of all kinds and the requirements of the specialty boards. Under the circumstances many residencies were created and approved which did not provide or continue real educational opportunities once they were established.

It is not the purpose nor is there national need that medical schools produce enough graduates each year to fill all of the "approved" hospital positions. Many of them now are intended and designed more as service functions for the staff and the hospital than for educational purposes. The intent of the internship and residency is primarily educational, not for hospital services alone, although the care of the patients is an obligation of the house officers under supervision of the attending physicians and medical board and, when properly carried out, a valuable learning experience.

It is not difficult to predict what might happen if the medical schools were called upon to fill all or even a larger percentage of hospital house staff positions. Such a plan would produce a substantial surplus of inadequately trained doctors, assuming that the schools could even get enough students and sufficient staffs to teach them. At the present time there are not enough qualified applicants to fill the existing medical schools. In regard to this particular situation there are too many "approved" internships and residencies—not too few medical graduates.

Congress passed the United States Information and Educational Exchange Act in 1948. This law facilitates the issuance of visas for "educational purposes" to foreign students from most areas of the world but does not set up any educational standards for admission to the country. The creation of the vacuum mentioned earlier and this action by the Federal Government encouraging graduates of foreign medical schools to come to this country have presented certain difficulties. The open invitation to medical graduates from all over the world to come to the United States regardless of the level of their professional preparation has precipitated an acute situation because there was little or no forward planning to provide either adequate requirements for the care of patients in the hospitals employing them or for the educational opportunities that many of these men and women from foreign countries had expected would be available.

The most logical solution to the staffing of American hospitals not offering sufficient opportunities for approval as educational services is the employment by the hospitals of well qualified recent graduates on a full-time or part-time basis. Such young men and women can remain in the positions for several years while they themselves are getting established in the community. This in part would solve the difficult period between the completion of residency

training or military service and the start of practice. Studies indicate that a majority of present residents would welcome such opportunities under proper conditions.

The discussion of the idea of a School of Basic Medical Sciences is a timely subject because there is considerable likelihood that 8 or 10 such schools of "Human Biology" or "Life Sciences," commonly referred to as two year medical schools or as Schools of Basic Medical Sciences, will be created in the next few years. This possible development is of great importance and has many ramifications in the university structure and as potential sources of students who may be added to the third year classes of the four year schools.

It is my impression that there is no urgent need to create a School of Basic Medical Sciences in Maryland at this time for the reasons which you recite. A number of four year schools can take more students into their third and fourth year than they can accommodate in the first year of the medical course because of the bottleneck of laboratory space and instructional staff in that year and the availability of unused clinical facilities and potential or available teaching staffs in large cities for the last two years of the course. Some of the large universities without medical schools already have nearly all of the essential facilities and staff to develop complete graduate programs in human biology or the life sciences and thereby provide much of the first two years of a medical course, upon completion of which students could transfer to the third year of a full four year school or continue as investigators and teachers in the basic medical sciences in either four year schools or in the new programs.

Graduate teaching in human biology would offer opportunities of developing close ties between the medical sciences and other major university divisions than now exist. It would become a living bridge between the ever-expanding physical, chemical and social sciences and the phenomenal demands of the medical and health services of the nation and the world. The newer concepts of health and of medical research and of professional education embrace philosophy, economics, anthropology and mathematics in varying degrees. The creation of integrated investigations and instruction in human biology would put added emphasis on the development of broadly trained leaders for the next generation of medical teachers and practitioners.

The amount of hospital facilities and clinical staffs in many big cities not now used in medical instruction is an open invitation to

develop quickly many new resources for medical instruction at reasonable cost and to the benefit of those hospitals, the local communities and the nation. Such developments would be consistent with the upward extension of medical education into the hospital internship and residency programs, now including over 40,000 "graduate" medical students, and into the continuation education of physicians in practice, all of whom are parts of the whole spectrum of present day medical education.

The conclusions and suggestions in regard to possible expansion of the two medical schools in Baltimore, if concurred in by them sound modest and attainable. All existing medical schools are endeavoring to produce a maximal number of graduates of competence even though at this time there is a shortage of top quality students seeking admission to some of the schools. Certain areas of the country have the educational, hospital, professional and financial resources necessary to develop new schools, either in the basic medical sciences or in full four year courses, and should be expected and encouraged to contribute to their own neighborhoods as well as to the national needs. In my opinion, Maryland can best serve the broad objectives your report outlines by strengthening and expanding modestly the existing strong, outstanding programs already in operation.

One point that is emphasized in Chapter Two is most timely, namely—that the problems of medical education cannot be separated from those of general education since the former, in the last analysis, is dependent upon the latter. It is evident from your data that the State of Maryland is supplying about the average number of students per 100,000 of the population. It might be expected that this ratio would rise in view of the improving economic situation in your area.

You also point out the influences that bear upon the decision of a medical graduate to locate in a particular place. The site of the internship and residency bear importantly upon those considerations, as you point out in relation to the additions to the practicing profession in your state.

There is considerable misunderstanding as to the function of medical schools in the matter of supplying house staffs to hospitals. You discuss that thoroughly in Chapter Two. On the following page you refer to the foreign graduates again and perhaps only one more comment needs to be made, namely that most of the foreign medical

graduates are found in the hospitals that provide little or no educational experience, thus defeating the alleged purpose of these foreigners coming to this country.

Your report puts proper emphasis on the situation in regard to the Negro citizen and physician. Far too little is being done in this area of public responsibility but, as you have pointed out, this problem of professional education is so closely related to the broad field of general education which, for so many colored boys and girls, is unsatisfactory.

Chapter Three is an excellent presentation of the question of Schools of Basic Medical Sciences to which reference was made earlier. Incidentally, the change in the attitude among medical educators toward Schools of Basic Medical Sciences in the last few years is a reversal of the commonly held convictions of two decades ago. But present day circumstances, the need of more physicians, scientists and teachers and other considerations justify a new look at the whole problem of scientific and clinical manpower.

In the discussion of the "two year schools" special importance was attached to the attrition in the first two years of the medical course, partly as an explanation of the excess of clinical facilities available in the last two years of the four-year courses. That apparent relationship may not be important because in the large cities the excess of clinical facilities and staffs has little relationship to medical school enrollment. It can be predicted that something will be lost in the basic medical sciences as two year programs, but certain other and more significant advantages will be gained. You have covered a number of these points in the resume. Perhaps it is well to repeat what you point out in one place,—that many of the strongest of the medical schools have developed away from university campuses, sometimes with only nominal affiliation but yet with very strong academic motivation and leadership.

Usually the university is regarded as having almost the sole obligation for the preparation of physicians. Today it can meet only a portion of that duty. A substantial part of the clinical education of undergraduate medical students frequently is provided in other than university hospitals. Three-fourths of the 13,032 approved internships and over one-half of the 31,733 residencies are under such auspices. Although these appointments are ostensibly for training, the service features often are more prominent than the educational. The number of men and women in the internship and

residency phases of present day overall medical education and services in both university and non-university hospitals is five times the number of graduates each year from the medical schools.

The question of adequate preparation in a liberal education for the needs of present day medical education and practice has an important bearing on the length of time required to produce a physician. Telescoping the professional and the undergraduate college courses was a method used for a period in the past and then discontinued for several reasons. It is now being revived under new circumstances. The introduction of the longer hospital period of training plus the requirements of military service after graduation have intensified the challenge to reduce the long span of professional education. The most satisfactory solution would be to strengthen, vitalize and shorten the period of secondary and college education, as recommended in recent studies, rather than to curtail and interfere with the medical course proper which is currently being broadened to include the social and basic sciences.

The preprofessional liberal arts period which reaches its culmination in the last year of those colleges that provide the highest quality of instruction should give the student an opportunity to understand, appreciate and share the cultural heritage of our civilization. To curtail that opportunity, which comes only once in a lifetime, and to limit the college segment for physicians largely to an abbreviated contact with the liberal arts and a condensed curriculum in the basic sciences, supplemented by superficial acquaintance with a few social problems, may not serve the best purposes of the profession and, in the long run, of the nation. The adaptation of professional education to the unique American structure of the undergraduate college is a major concern of higher learning at all levels.

Data on the financing of medical schools published recently by the Association of American Medical Schools are of interest. In 26 private schools, the average total expenditures for basic operations has risen from $515,800 to $2,560,300 between 1940 and 1958. Tuition fees have risen on the average in this group from $151,500 in 1940 to $416,800 in 1958. However, the percentage of expenses met by tuition has dropped from 29.4% to 16.3%. The average endowment income of the groups has grown in that period from $158,200 to $468,200. As in the case of tuition income, the percentage of expenses met by endowment income has declined from

30.7% to 18.3%. Non-Federal grants have gone from $42,400 to $357,600 on the average. Support from general university funds has grown from $103,400 to $322,100, but declined percentagewise from 20.0% to 12.6%. Teaching expenses paid by hospitals and clinics have moved from $17,300 to $269,500. The amounts received from professional fees of full-time members of the staff are increasing and in some instances contribute substantially to the income of the school. Federal grants have jumped from $1,400 to $1,161,400 on the average in these 26 institutions,—from 1.5% of total income in 1940 to 64.9% in 1958.

In 16 publicly supported (state) schools the average tuition has gone from $100,500 to $251,500, non-Federal grants from $27,000 to $158,200, state appropriations from $223,400 to $1,575,900, Federal grants from zero to $681,800.

Perhaps comment may be made on the development of medical centers as distinguished from medical schools. Such centers are always greater than the total of their parts. Witness the fact that instruction in the medical schools of the country is provided for about 85,000 students not enrolled in the medical course proper, compared with about 30,000 medical students.

Your statements regarding the Ph.D. in relation to the medical sciences and medical education is thorough and complete. More competent men and women need to be encouraged to enter this vital field of the national health program.

It has been predicted that while the number of graduates of medicine will reach about 7,900 in 1970 at the present rate of production, the number to receive the Doctor of Philosophy degree at that time may reach 18,000. The latter figure needs interpretation because Ph.D. degrees are now being offered in a great many new fields, in numerous institutions which cannot provide real advanced education and at different levels of excellence in established universities.

Probably the area of overall medical education that needs most cultivation and programming at this time is that of the continuation education of physicians in practice, both specialists and family physicians, particularly the latter. Your report outlines many of the efforts. In several places reference is made to the responsibility of having such programs under "medical school sponsorship." As you are aware, efforts in this direction have been made through a variety of methods but have not been as successful as the challenge

warrants. This is due largely to the fact that the medical schools themselves have very heavy demands upon them in their own areas of education, research and service and are already responsible for a number of community efforts. Frequently the faculties of medical schools have shown only nominal interest in the problem. Many hospitals and professional associations are trying to meet this responsibility but the rapidity with which new knowledge is being developed has made the challenge most formidable.

The gap is widening between what is known and what is applied effectively in practice. In some ways this is the largest single challenge to medical education and is the reason for the great emphasis in undergraduate medical education upon learning by the student rather than teaching by the faculty for the purposes of inculcating in the embryo physician sound methods and habits of study and learning which will equip him to continue his own self-education throughout his professional career. The emphasis is on the "how" rather than the "what" to learn.

Probably one of the most important defects in the whole scheme of medical education is the waste of talent and competence at the end of the hospital residency when many young men and women at that stage of superior development cannot easily be absorbed into the present structure of medical practice. This situation relates to the matter of modernizing the form and organization of medical care. Under existing conditions there is no well established bridge from the residency to practice although this is being solved in part through the slow development of various forms of group practice and salaried medical services, often in hospitals. This is a significant area of the overall medical problem because more than one-half of the young men and women now in such residencies desire to remain in full-time teaching or research or some kind of full-time medical service after completion of their clinical preparation. They are available to enter community health services under proper circumstances.

The statements in Chapter Eight on medical research need no comment because they are comprehensive. The impact of the research emphasis in medical schools is disquieting to certain institutions because of the tendency to unbalance the educational effort. The large amounts of money presently available for research programs emphasizes the shortage of sufficient facilities in the medical schools and hospitals of the country to spend this money wisely and

more particularly focuses upon the urgent need of properly qualified individuals to carry forward the investigations. The temporary nature of most of these grants points to the necessity of finding a method of providing stable careers for dedicated individuals that will insure their recruitment and permanent employment. The continuing growth of research support on a temporary basis is leading to the separation, control, direction and utilization of research personnel from the broad objectives of the educational institutions, particularly in the matters of promotion, remuneration, recognition, relief from teaching responsibilities and similar considerations. This is a matter of growing concern to the medical schools and universities because, in the long run, it will make the overall program less effective and more costly.

The research programs are also putting emphasis on the widening base of the scientific approach to many of the health problems since the challenges require the cooperation of physicists, microbiologists, anthropologists, psychologists, biochemists, social scientists, administrators, employers, public officials and others. It is obvious there is dependence on the team approach to many of the health problems, on which team the physician is only one, but an essential, member.

Thank you for permitting me to participate in your deliberations.

CRITIQUE OF REPORT ON MEDICAL EDUCATION IN MARYLAND

by

THOMAS PARRAN, M.D.

This critique consists of two parts: First, general comments about the Report, and second, specific comments which relate to the text in each of the chapters.

GENERAL COMMENTS

1. At the outset let me say that I find this Report to be on the whole a competent presentation of the present and prospective situation as regards the need for physicians in the State of Maryland. It is not a 1961 version of the Flexner Report of 1910. Quite under-

standably, the three recent Federal reports dealing with medical and scientific manpower needs, and Federal funds for research and training, form a base for consideration of the medical manpower problems of Maryland.

2. The important concept that it is difficult for any one State, and specifically the State of Maryland, to plan its future medical care needs (but rather should relate its planning to the total national picture) is a sound approach.

3. Because of the large size of the subcommittee, it is assumed that the draft Report has been prepared by the Staff.

4. While the present ratio of physicians to population in Maryland or in the U.S.A. has no established validity as a basis for future planning, it is probably as useful a yardstick as any that can be developed in a study such as this. Hence, this ratio should not be presented as "valid," since its validity is questioned later in the Report.

5. The ratio of physicians to population varies greatly as between the several states (as well as within the states), and between the various countries. The differences are due, in large part, to the variation in per capita income—except for the unusual situation existing in Israel and in the regimented economy of the Soviet Union.

6. Over the years in the United States the percentage of gross national product spent for medical care has gradually increased from about three per cent to about five per cent. The larger amount in recent years has been due chiefly to increased costs of hospitalization, increased use of hospitals, and the increasing proportion of the medical dollar which is spent for drugs.

7. Throughout the Report, insufficient differentiation is made between the "need" for medical services on a biological basis, and the "demand" for such services, representing financial ability and willingness to pay for such services.

8. It is believed that the *demand* for medical care will continue to increase if the national economy continues to expand. (In the event of a severe depression, some decrease in demand can be anticipated.) However, it is believed that planning for medical care in the future should be on the premise that this country will continue its economic growth; will have an increase in the average per

capita income, a higher level of education, a growing demand for medical services.

9. It is felt that in the Report, insufficient emphasis is placed upon a number of issues, which are listed below:

A. The higher average age of the population, especially the larger percentage of persons in the older age groups, will require more medical care.

B. The imminent spreading of health (or sickness) insurance for the superannuated will result in increased utilization of physicians' services.

C. The trend toward group practice is mentioned in the Report, but is insufficiently emphasized. This type of practice will largely replace the individual "solo" type of medical service in future and will result in more effective and economical utilization of the physicians' time, and more use of para-medical personnel.

D. Balancing these anticipated economies in the purveying of medical care will be the parallel growth of comprehensive prepaid insurance (hopefully to be rendered on a service basis rather than through cash indemnity payments), which will increase the demand for medical services.

E. No mention is made in the Report of the percentage of Maryland physicians who have hospital affiliations. The goal should be a hospital affiliation for every physician as the most important means of improving medical care, and especially of promoting post-graduate medical education.

F. The proposal for State funds for medical scholarships, administered by the two existing schools on the basis of scholastic aptitude and financial need is sound, and such scholarships should not be limited to State residents.

G. State scholarship aid should not be limited to students enrolled in the two medical schools located in Maryland, but should be extended to include Maryland residents who enroll elsewhere.

H. There is no magic formula whereby the two medical schools say they can take "X" additional students, but not "X plus 22" in their entering classes during the next 15 years.

I. State aid to these schools as recommended should be predicated on their willingness to lift their sights further, to help meet the National need, by at least another 22-25 students admitted each year.

Specific Comments

Chapter One

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4 ¶4 . . . it should be stated that these foreign students, by and large, get the poorest educational experience, frequently uncoordinated as between the first and subsequent years; that often they serve in non-teaching hospitals as cheap hired hands; that the medical competence of nearly half of them is below the minimum; that better screening before the issuance of an educational visa is urgent; that the foreign policy of our country is badly served when such incompetents are sent home because of lack of professional skills; that these interns come from countries which need far more medical manpower than we do.

I agree with the statement that the U.S.A. should welcome continued immigration, and especially of competent young physicians, but this issue should be separated from medical internships sought by foreign medical graduates.

5 ¶5 This is one of the most important sections of the Report, differentiating, as it does, between a state perspective and a national perspective. I agree with the text as written, except that the statement, "There exists a potential for greater effort, should the state wish to assume it," should be qualified, as is done later in the Report.

6 ¶7 The College Park campus would seem to offer a possibility for a two-year program of training both for future M.D.'s and for Ph.D.'s. Such a location would bring the students into a closer University relationship than does the Baltimore campus of its Medical School.

7 ¶7 This statement is too negative. It assumes that Hopkins and Maryland can shake only a little dust out

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of their traditions. "This approach to our national responsibilities *need not be* the least flexible of all." There are some very good medical colleges in this country which graduate each year 50% more students than either of the Maryland schools. This paragraph should be elaborated, a subject which I shall discuss later in the text [Chapter Five].

8 ¶10 An excellent statement which merits elaboration.

"Major Recommendations"

8 ¶1 I would modify this general recommendation for state support of the two medical schools by making it conditional for them to absorb at least another 22 students rather than have this "a subject for re-study."

9 ¶3 An obvious need.

9 ¶5 A good statement of obvious need. The Planning Commission should immediately ask the agencies mentioned what each proposes to do about the problem and their replies should be included in the Report.

Chapter Two

18-20 This is an excellent discussion differentiating, as it does, the difficulty in projecting a need for physicians state-by-state rather than on a national basis. A minor comment relates to the middle of page 19. It appears from the text [page 63] that original residence of the medical student continues to be the most important single factor in determining where he will practice in the future. Although, as pointed out, the relative importance of place of internship and of residency training are of increasing importance. It is commonly known that since the Civil War many medical graduates from impoverished areas in the South sought internships in Northern centers where many of them located for practice, or, alternatively, sought a career in the Army, Navy, or Public Health Service.

The discussion on page 20 concerning rigid residence requirements is excellent.

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23-24 This is a clear discussion of the problem.

24 Maryland's responsibility to meet the Nation's physician needs: This seems to be a sound approach, as is the continued discussion for the rest of this chapter.

Chapter Four

This chapter is well written and the data presented are impressive.

Chapter Five

The conclusions and recommendations are well stated. I am particularly pleased to see the recommendation that increased scholarship and loan funds should be provided by both the State and Federal governments. I would put more emphasis on scholarships (less on loans). Since we have an affluent society why should we not pay-as-we-go in medical and other education, rather than put the burden on the decades ahead?

72 Information on the percentage of students being accepted in medical schools in the "A," "B," and "C" quality point categories has been published by the A.A.M.C. and is shown in the following table:

College-Grade Average First-Year Medical Students		1950-1951 %	1957-1958 %
3.6-4.0	(A)	40	18
2.6-3.5	(B)	43	66
1.0-2.5	(C)	17	16

During the same period the number of medical school applicants "represented as percentage of college graduates" dropped from 5.1 in 1950 to 4.1 in 1958.

72-73 *Finances.* The recommendation that scholarships should be awarded by the individual medical schools rather than by a State official or agency is sound. In addition, I suggest that consideration be given to State scholarships awarded to students who are accepted in medical schools outside of the State of Maryland. The State of New York has a system of Regents scholarships

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which are awarded on a competitive basis, but available only to students who enroll in institutions of higher education in New York State. This seems shortsighted since tuition aid to students rarely, if ever, meets the full cost of education. A system of State scholarships in medicine available to the student whether or not he enrolls in a Maryland school might reduce the estimated future shortage in annual admissions of 22 students.

73-75 I have commented earlier on more specific recommendations to ascertain from the several agencies mentioned what each of the organizations proposes to do about the problem of discrimination. Their replies should be a part of the final Report.

Chapter Six

The evidence presented in this chapter seems conclusive that there is no serious shortage of physicians in smaller communities, or accessible to smaller communities. In particular, I like the discussion on page 79 for part-time physicians' offices. It should be recorded that funds are available under the Hill-Burton Act for the construction of community health centers which could be utilized in part for physicians' offices and where there should be, desirably, a public health nurse in residence. Maryland has done little about this; Virginia has done much.

Chapter Seven

The problem of post graduate medical education is one of the most baffling ones facing medical educators, although both the University of Maryland and the Johns Hopkins School of Medicine have had over the years good programs of post graduate and continuing education. It should be recognized in the Report that this type of community service by the medical faculties requires that they be staffed in greater depth than would be needed if the faculties were engaged only in research and intra-mural teaching. It is not made clear in this

chapter whether there is an agreement between the two schools for some geographic distribution of the responsibility of each for post graduate education. This would seem to be obviously desirable.

No reference is made in this chapter or elsewhere in the Report to the role of the "detail" man representing the pharmaceutical houses. In this connection, see *Journal of Medical Education* January, 1961, Volume 36, Number 1, Page 1, "Selling Drugs by 'Educating' Physicians."

Chapter Eight

Medical Research and Medical Education. Both the conclusions and recommendations in this chapter seem sound. I like the way the material is presented. I would suggest a further point to the effect that personnel in the employ of the State should have appropriate teaching appointments in the medical schools, thereby bringing about a mutually reciprocal relationship.

POSTSCRIPT

"We all know that we must expand even more our production of medical scientists and teachers. But we cannot accomplish these aims if we focus our attention solely and narrowly upon medical education. For how can we improve substantially the quality of our graduates without improving first the quality of our faculties and the background and attitudes of the students admitted to our classes? Thus medical education is closely and inextricably tied in with problems facing our universities broadly. In order to attain the relatively narrow interests of medical education, we find it necessary to lend our support and energies to education in general. And this is even more imperative from the viewpoint of our duties to the nation and to humanity.

"In common cause with colleagues in other disciplines who share the task of fortifying the bastions of learning upon which our nation depends, let us reduce our arguments to the basic essentials which can then be put in such dress as can be most effective and persuasive in enlisting public support. For today one can say as truly as did Francis Bacon three hundred and fifty years ago, that 'states were too busy with their laws and too negligent in point of education'."

H. Stanley Bennett, M.D., *The Medical Sciences—A Source of Scholarly Strength for the University,* JAMA 7/30/60

APPENDICES

APPENDIX I

PHYSICIAN DISTRIBUTION—MARYLAND-DISTRICT OF COLUMBIA

Table A Distribution of Non-Federal Physicians in Each County, by Type of Pratcice, 1959
Physicians Not in Private Practice

Table B Age Distribution of Non-Federal Physicians in Each County in Mid-1959

Table C Selected Health Personnel in Each County

Table D Distribution of Non-Federal Physicians in Each Standard Metropolitan Statistical Area, by Type of Practice, 1959

Table E Age Distribution of Non-Federal Physicians in Each Standard Metropolitan Statistical Area in Mid-1959

Table F Number of Active Non-Federal Physicians in Each Standard Metropolitan Statistical Area in 1959 and Physician-Population Ratios in 1959, 1957, 1949, and 1940

Table G Selected Health Personnel in Each Standard Metropolitan Statistical Area

Source: *Health Manpower Source Book, Section 10, Physicians' Age, Type of Practice, and Location,* U. S. Department of Health, Education, and Welfare, Public Health Service, 1960

Table A

DISTRIBUTION OF NON-FEDERAL PHYSICIANS IN EACH COUNTY, BY TYPE OF PRACTICE, 1959

State and County	Total Number of Physicians	Physicians in Private Practice		
		General Practice	Special Attention To Specialty	Practice Limited To Specialty
Maryland				
Allegany	67	20	8	33
Anne Arundel	105	27	15	27
Baltimore	176	60	13	32
Baltimore City	2,478	420	144	867
Calvert	8	4	1	—
Caroline	12	9	1	—
Carroll	56	24	2	1
Cecil	33	12	5	3
Charles	12	5	2	2
Dorchester	23	9	—	8
Frederick	70	29	6	24
Garrett	9	7	—	1
Harford	48	25	6	6
Howard	17	10	—	2
Kent	17	6	1	3
Montgomery	489	111	34	185
Prince Georges	152	77	11	24
Queen Annes	9	7	—	1
St. Marys	17	11	3	2
Somerset	14	10	3	—
Talbot	41	10	2	17
Washington	85	36	7	35
Wicomico	62	21	5	30
Worcester	18	12	3	—
Totals	4,018	962	272	1,303
District of Columbia	2,527	412	113	946

State and County	Physicians Not in Private Practice			
	Interns or Resident Physicians	Other Full-time Hospital Services	Full-time Research, Teaching, Public Health	Retired Not in Practice
Maryland				
Allegany	1	2	2	1
Anne Arundel	4	11	2	19
Baltimore	19	29	6	17
Baltimore City	563	268	131	85
Calvert	—	—	—	3
Caroline	—	—	1	1
Carroll	4	21	2	2
Cecil	9	—	2	2
Charles	—	1	—	2
Dorchester	—	3	—	3
Frederick	—	5	2	4
Garrett	—	—	1	—
Harford	—	1	7	3
Howard	—	1	1	3

TABLE A (Cont.)

State and County	Physicians Not in Private Practice: Interns or Resident Physicians	Other Full-time Hospital Services	Full-time Research, Teaching, Public Health	Retired Not in Practice
Maryland (Cont.)				
Kent	1	1	1	4
Montgomery	16	69	22	52
Prince Georges	2	20	7	11
Queen Annes	—	—	1	—
St. Marys	—	—	1	—
Somerset	—	—	1	—
Talbot	—	4	1	7
Washington	—	4	3	—
Wicomico	—	4	1	1
Worcester	—	—	1	2
Total	619	444	196	222
District of Columbia	517	214	212	113

Table B

AGE DISTRIBUTION OF NON-FEDERAL PHYSICIANS IN EACH COUNTY IN MID-1959

State and County	Total Number of Physicians	Age of Physicians on December 31, 1958										
		Under 30 Years	30-34 Years	35-39 Years	40-44 Years	45-49 Years	50-54 Years	55-59 Years	60-64 Years	65-69 Years	70-74 Years	75 Years and Over
Maryland												
Allegany	67	—	10	8	10	8	13	6	4	4	1	3
Anne Arundel	105	1	10	24	21	13	6	4	2	7	5	11
Baltimore	176	7	23	38	21	9	28	11	12	5	7	14
Batimore City	2,478	357	411	349	286	289	199	161	137	111	82	86
Calvert	8	—	—	—	1	1	1	—	1	—	1	3
Caroline	12	—	1	1	1	2	1	4	1	—	1	—
Carroll	56	1	5	7	6	4	6	8	6	3	4	5
Cecil	33	2	6	5	7	1	3	1	1	—	4	3
Charles	12	—	—	2	3	1	1	—	2	—	1	2
Dorchester	23	1	—	4	1	5	4	—	4	3	1	—
Frederick	70	1	8	10	11	4	9	9	4	6	1	6
Garrett	9	1	—	2	1	1	2	1	—	—	—	1
Harford	48	2	6	12	10	2	6	1	2	1	1	3
Howard	17	—	1	6	3	1	—	1	—	2	—	3
Kent	17	—	4	1	—	—	1	3	1	2	2	3
Montgomery	489	13	86	104	95	60	36	22	20	19	18	16
Prince Georges	152	3	29	27	22	18	19	8	7	5	5	9
Queen Annes	9	—	1	—	2	1	—	—	1	1	—	3
St. Marys	17	—	3	4	3	2	1	—	1	2	—	1
Somerset	14	—	—	2	2	—	2	1	1	1	3	2
Talbot	41	—	3	4	5	5	3	3	4	7	2	5
Washington	85	3	10	11	15	7	12	8	7	6	3	3
Wicomico	62	—	10	14	11	9	7	2	3	1	2	3
Worcester	18	1	2	1	4	4	1	1	1	—	1	2
Total	4,018	393	629	636	541	447	361	255	222	186	145	187
District of Columbia	2,527	278	383	318	285	318	281	212	151	126	70	105

Table C

SELECTED HEALTH PERSONNEL IN EACH COUNTY

State and County	Physicians (M.D. and D.O.)			Dentists		Veterinarians	
	Non-Federal Physicians 1959	Federal Physicians Employed By PHS and Va	Student Enrollment 1958-59	Non-Federal Dentists 1959	Student Enrollment 1958-59	Non-Federal Veterinarians 1957	Student Enrollment 1957-58
Maryland							
Allegany	67	—	—	34	—	2	—
Anne Arundel	107	—	—	35	—	5	—
Baltimore	182	19	—	[1]	—	17	—
Baltimore City	2,478	107	645	694	416	49	—
Calvert	8	—	—	2	—	—	—
Caroline	12	—	—	5	—	2	—
Carroll	56	—	—	18	—	10	—
Cecil	33	22	—	11	—	4	—
Charles	12	—	—	3	—	1	—
Dorchester	23	—	—	6	—	4	—
Frederick	71	—	—	24	—	20	—
Garrett	9	—	—	4	—	2	—
Harford	48	—	—	23	—	14	—
Howard	17	—	—	3	—	3	—
Kent	18	—	—	5	—	6	—
Montgomery	491	450	—	185	—	39	—
Prince Georges	153	1	—	80	—	24	—
Queen Annes	9	—	—	1	—	4	—
St. Marys	17	—	—	5	—	1	—
Somerset	14	—	—	1	—	—	—
Talbot	41	—	—	9	—	4	—
Washington	88	—	—	31	—	7	—
Wicomico	63	—	—	20	—	8	—
Worcester	18	—	—	10	—	1	—
Total	4,035	599	645	1,209	416	227	—
District of Columbia	2,547	250	1,130	730	602	57	—

[1] Included in Baltimore City.

Table D

DISTRIBUTION OF NON-FEDERAL PHYSICIANS IN EACH STANDARD METROPOLITAN STATISTICAL AREA, BY TYPE OF PRACTICE, 1959

Standard Metropolitan Statistical Area	Total Number of Physicians	Physicians in Private Practice			Physicians Not in Private Practice			
		General Practice	Special Attention To Specialty	Practice Limited To Specialty	Intern or Resident Physicians	Other Full-time Hospital Services	Full-time Research, Teaching Public Health	Retired, Not in Practice
Baltimore, Md.	2,832	541	174	929	590	330	142	126
Washington, D.C.-Md.-Va. ..	3,597	731	186	1,343	539	319	255	224

Table E

AGE DISTRIBUTION OF NON-FEDERAL PHYSICIANS IN EACH STANDARD METROPOLITAN STATISTICAL AREA IN MID-1959

Standard Metropolitan Statistical Area	Total Number of Physicians	Age of Physicians on December 31, 1958										
		22-99 Years	30-34 Years	35-39 Years	40-44 Years	45-49 Years	50-54 Years	55-59 Years	60-64 Years	65-69 Years	70-74 Years	75 Years and Over
Baltimore, Md. ...	2,832	366	450	424	337	316	239	185	157	128	98	119
Washington, D.C.-Md.-Va.	3,597	303	576	519	474	463	384	261	188	176	106	147

Table F

NUMBER OF ACTIVE NON-FEDERAL PHYSICIANS IN EACH STANDARD METROPOLITAN STATISTICAL AREA IN 1959 AND PHYSICIAN-POPULATION RATIOS IN 1959, 1957, 1949, AND 1940

Standard Metropolitan Statistical Area	Number of Counties [1]	Number of Active Non-Federal Physicians 1959	Physicians Per 100,000 Population			
			1959	1957	1949	1940
Baltimore, Md.	5	2,706	166	160	171	184
Washington, D.C.-Md.-Va.	5	3,373	173	164	181	182

[1] Number of Counties in the 1959 concept of *STANDARD METROPOLITAN STATISTICAL AREAS*. Rates for 1940-1957 are not shown for standard metropolitan statistical areas added since 1957.

Table G

SELECTED HEALTH PERSONNEL IN EACH STANDARD METROPOLITAN STATISTICAL AREA

Standard Metropolitan Statistical Area	Physicians (M.D. and D.O.)			Dentists		Veterinarians	
	Non-Federal Physicians 1959	Federal Physicians Employed By PHS and VA	Student Enrollment 1958-59	Non-Federal Dentists 1959	Student Enrollment 1958-59	Non-Federal Veterinarians 1957	Student Enrollment 1957-58
Baltimore, Md.	2,840	126	645	750	416	84	
Washington, D.C.-Md.-Va.	3,625	703	1,130	1,188	602	152	

APPENDIX II

VITAL STATISTICS

Source: Table A—*Vital Statistics-Special Reports, National Summaries,* Vol. 52, No. 7, August 24, 1960

Table B—*Vital Statistics of the United States, 1958,* Vol. 1

Tables C, D, E, F, G, H—*Final Vital Statistics Tables, Maryland 1959.* Division of Statistical Research and Records, Maryland State Department of Health

Table A

DEATH RATES FOR THE 10 LEADING CAUSES OF DEATH: MARYLAND COMPARED TO U. S. AND SELECTED STATES (1958)

(Excludes fetal deaths. Rates per 100,000 estimated midyear population in each area.)

Area and Cause of Death	Md.	Cal.	D.C.	Idaho	Ill.	Mass.	Mich.	N.C.	N.D.	N.Y.	Penna.	Va.	All U.S.
All Causes	915.8	881.6	1,081.2	803.7	1,016.7	1,155.5	842.1	798.3	817.4	1,065.5	1,059.6	848.4	951.3
Diseases of heart	384.8	326.7	385.6	290.8	440.4	487.3	322.0	281.4	291.2	476.4	445.6	304.4	367.9
Malignant neoplasms, including neoplasms of lymphatic and hematopoietic tissues	140.1	143.6	175.8	106.3	161.0	198.3	139.6	96.6	120.2	185.1	167.8	112.8	146.9
Vascular lesions affecting central nervous system	77.9	96.9	96.3	96.5	109.8	127.7	96.3	106.0	108.9	96.1	113.5	108.6	110.1
Certain diseases of early infancy	46.2	38.5	65.7	35.4	35.9	32.6	40.8	44.4	39.8	34.4	37.0	47.5	39.8
Accidents	43.1	52.6	43.5	83.1	45.9	48.6	42.4	55.0	61.0	40.0	46.0	54.8	52.3
Motor vehicle accidents	16.4	25.9	12.1	40.3	19.3	12.6	18.7	25.3	27.4	13.9	16.1	19.8	21.3
Other accidents	26.7	26.8	31.4	42.8	26.6	36.0	23.7	29.8	33.5	26.1	30.0	34.9	31.0
Influenza & pneumonia, except pneumonia of newborn	29.2	28.8	50.4	21.2	40.1	41.8	28.0	30.0	29.6	37.1	30.7	32.1	22.1
Diabetes mellitus	17.1	—	—	9.7	15.2	20.6	20.5	11.4	17.7	18.9	22.4	11.2	15.9
General arteriosclerosis	15.3	21.0	19.3	21.2	19.5	26.0	16.5	13.2	18.5	19.1	26.0	14.4	19.9
Congenital malformations	12.7	—	—	13.8	11.6	—	13.0	12.1	13.5	11.8	—	12.4	12.4
Cirrhosis of liver	11.3	17.0	22.9	—	12.0	14.7	10.3	—	—	16.0	12.2	—	10.8
Physician-population ratio per 100,000 (non-Federal)— 1957	135.1	160.9	302.9	88.1	126.6	182.2	105.6	91.0	75.0	191.2	132.0	100.4	132.4*

* Includes Armed Forces overseas.

Table B

DEATH RATES BY AGE: MARYLAND COMPARED WITH UNITED STATES AND SELECTED STATES * (1958)

(Includes only deaths occurring within the continental United States. Excludes fetal deaths.)

	Md.	Cal.	D.C.	Idaho	Ill.	Mass.	Mich.	N.C.	N.D.	N.Y.	Penna.	Va.	All U.S.
Total	920	880	1,080	800	1,020	1,160	840	800	820	1,070	1,060	850	950
Under 5 years	720	600	880	630	640	570	590	790	610	610	630	760	670
5-19 years	50	—	60	80	60	50	50	60	60	50	50	60	60
20-44 years	210	200	280	210	210	180	180	250	170	200	190	230	210
45-64 years	1,350	1,120	1,440	900	1,180	1,220	1,110	1,250	790	1,250	1,250	1,250	1,170
65 years and over	7,190	6,130	7,070	5,480	6,590	7,150	6,360	5,670	6,350	6,780	6,870	6,620	6,370
Physician-population ratio per 100,000 (non-Federal)—1957	135.1	160.9	302.9	88.1	126.6	182.2	105.6	91.0	75.0	191.2	132.0	100.4	132.4

* Adjusted by Subcommittee's Staff to rate per 100,000. Final digit, therefore, varies from true rate.

Table C

ESTIMATED POPULATION, BY RACE. MARYLAND AREAS, JULY 1, 1959

Area	POPULATION			PERCENT	
	Total	White	Non-White	White	Non-White
Maryland State	3,010,824	2,536,056	474,768	84.2	15.8
Baltimore City	919,113	627,754	291,359	68.3	31.7
Total Counties	2,091,711	1,908,302	183,409	91.2	8.8
Allegany	83,831	82,825	1,006	98.8	1.2
Anne Arundel	197,095	170,093	27,002	86.3	13.7
Baltimore	475,201	459,519	15,682	96.7	3.3
Calvert	15,436	10,095	5,341	65.4	34.6
Caroline	19,226	15,381	3,845	80.0	20.0
Carroll	51,899	49,564	2,335	95.5	4.5
Cecil	47,596	44,407	3,189	93.3	6.7
Charles	32,425	22,471	9,954	69.3	30.7
Dorchester	29,447	21,172	8,275	71.9	28.1
Frederick	71,460	67,673	3,787	94.7	5.3
Garrett	20,253	20,253	—	100.0	—
Harford	74,899	67,709	7,190	90.4	9.6
Howard	35,018	30,466	4,552	87.0	13.0
Kent	15,092	10,896	4,196	72.2	27.8
Montgomery	324,425	311,448	12,977	96.0	4.0
Prince Georges	341,811	311,390	30,421	91.1	8.9
Queen Annes	16,301	11,965	4,336	73.4	26.6
Saint Marys	38,803	31,857	6,946	82.1	17.9
Somerset	19,375	12,206	7,169	63.0	37.0
Talbot	21,144	16,112	5,032	76.2	23.8
Washington	89,810	87,295	2,515	97.2	2.8
Wicomico	47,994	38,491	9,503	80.2	19.8
Worcester	23,170	15,014	8,156	64.8	35.2

Table D

RATES FOR BIRTHS, DEATHS, INFANT DEATHS AND MATERNAL DEATHS, BY RACE. MARYLAND AREAS, 1959

Area of Residence	BIRTH RATES [a]			DEATH RATES [a]			INFANT DEATH RATES [b]			MATERNAL DEATH RATES [b c]		
	Total	White	Non-White	Total	White	Non-White	Total	White	Non-White	Total	White	Non-White
Maryland State	25.6	23.5	37.1	9.0	8.6	11.0	28.6	23.0	47.6	3.4	2.5	6.2
Baltimore City	26.0	20.0	38.8	12.2	12.6	11.3	35.4	25.0	47.0	3.3	1.6	5.3
Total Counties	25.5	24.6	34.4	7.6	7.3	10.6	25.6	22.5	48.6	3.4	2.8	7.9
Allegany	19.9	19.8	23.9	11.5	11.4	16.9	21.6	21.3	41.7			
Anne Arundel	25.7	24.7	31.9	6.5	6.2	8.9	26.7	24.3	38.3			
Baltimore	25.2	25.0	31.8	6.9	6.8	9.4	22.4	21.9	34.1			
Calvert	29.6	19.5	48.7	8.6	7.6	10.3	28.4	15.2	38.5			
Caroline	22.6	20.0	33.3	13.0	12.5	14.8	25.3	9.8	62.5			
Carroll	21.4	21.3	23.6	10.2	10.2	10.7	24.3	20.9	90.9			
Cecil	26.9	26.5	32.9	8.0	7.9	9.7	31.2	29.8	47.6			
Charles	30.1	24.4	42.8	7.7	6.3	10.7	35.9	7.3	72.8			
Dorchester	19.0	15.9	27.1	10.9	10.8	11.1	37.5	26.8	53.6			
Frederick	22.4	21.1	45.2	10.2	10.0	14.8	23.7	21.0	46.8			
Garrett	21.9	21.9	—	11.0	11.0	—	38.3	38.3	—			
Harford	28.3	27.4	36.6	6.8	6.5	9.6	22.6	21.0	34.2			
Howard	24.5	24.4	25.0	7.6	7.3	10.1	37.3	33.6	61.4			
Kent	24.8	23.1	29.3	14.4	14.4	14.3	42.7	27.8	73.2			
Montgomery	24.2	23.9	30.7	5.8	5.7	8.2	21.0	19.5	50.3			
Prince Georges	29.9	29.0	38.9	5.6	5.3	8.3	24.5	21.8	44.8			
Queen Annes	22.2	20.3	27.4	11.7	11.5	12.5	44.2	32.9	67.2			
Saint Marys	36.9	35.2	44.6	6.2	5.2	10.8	27.3	24.1	38.7			
Somerset	20.8	15.7	29.4	15.9	15.7	16.3	44.7	31.2	56.9			
Talbot	22.1	20.1	28.4	14.0	13.4	16.1	36.4	24.7	62.9			
Washington	21.1	21.0	23.5	10.3	10.3	10.3	24.8	25.1	16.9			
Wicomico	23.8	20.0	39.1	11.0	10.5	12.9	42.1	32.5	61.8			
Worcester	24.5	20.2	32.5	12.7	12.9	12.4	42.3	33.0	52.8			

[a] Birth and total death rates are per 1,000 population.

[b] Infant death rates are per 1,000 live births; maternal deaths are per 10,000 live births.

[c] See Table F for numbers of infant and maternal deaths in each county. Rates were not calculated for individual counties because of small numbers.

Table E

STILLBIRTH RATES, NEONATAL DEATH RATES AND PERINATAL DEATH RATES, BY RACE. MARYLAND AREAS, 1959

Area of Residence	STILLBIRTH RATES *			NEONATAL DEATH RATES *			PERINATAL DEATH RATES *		
	Total	White	Non-White	Total	White	Non-White	Total	White	Non-White
Maryland State	16.4	14.4	23.1	20.9	17.8	31.1	37.2	32.2	54.2
Baltimore City	18.5	15.3	22.0	25.4	18.4	33.2	43.9	33.6	55.2
Total Counties	15.5	14.2	25.2	18.8	17.7	27.3	34.3	31.8	52.4
Allegany	13.8	12.8	83.3	15.0	15.2	—	28.8	28.0	83.3
Anne Arundel	14.8	13.1	23.2	19.2	19.8	16.3	34.0	32.9	39.5
Baltimore	13.0	12.3	30.1	18.2	17.7	28.1	31.2	30.0	58.2
Calvert	30.6	20.3	38.5	15.3	5.1	23.1	46.0	25.4	61.5
Caroline	23.0	9.8	54.7	20.7	9.8	46.9	43.7	19.5	101.6
Carroll	14.4	14.2	18.2	16.2	17.1	—	30.6	31.3	18.2
Cecil	8.6	9.4	—	24.2	24.7	19.0	32.8	34.0	19.0
Charles	19.5	20.0	18.8	20.5	5.5	39.9	40.0	25.5	58.7
Dorchester	17.9	14.9	22.3	23.2	14.9	35.7	41.1	29.8	58.0
Frederick	18.7	18.2	23.4	15.6	13.3	35.1	34.3	31.4	58.5
Garrett	20.3	20.3	—	31.5	31.5	—	51.8	51.8	—
Harford	13.2	12.9	15.2	15.1	14.5	19.0	28.3	27.4	34.2
Howard	15.2	9.4	52.6	26.8	25.6	35.1	42.0	35.0	87.7
Kent	16.0	15.9	16.3	18.7	15.9	24.4	34.7	31.7	40.7
Montgomery	14.1	14.2	12.6	17.3	16.4	35.2	31.5	30.6	47.7
Prince Georges	18.3	17.6	23.7	18.0	17.3	23.7	36.3	34.8	47.4
Queen Annes	16.6	12.3	25.2	33.1	28.8	42.0	49.7	41.2	67.2
Saint Marys	17.5	11.6	38.7	21.0	19.6	25.8	38.5	31.3	64.5
Somerset	24.8	20.8	28.4	22.3	10.4	33.2	47.1	31.3	61.6
Talbot	12.8	12.3	14.0	19.3	15.4	28.0	32.1	27.8	42.0
Washington	12.1	12.5	—	18.5	18.5	16.9	30.6	31.1	16.9
Wicomico	20.2	16.9	26.9	28.0	26.0	32.3	48.2	42.9	59.1
Worcester	22.9	13.2	34.0	28.2	26.4	30.2	51.1	39.6	64.2

* These rates are computed per 1,000 live births. The numerator of the neonatal death rate is the number of deaths under 28 days. The numerator of the perinatal death rate is stillbirths plus deaths under 28 days.

Table F

INFANT DEATHS, MATERNAL DEATHS AND STILLBIRTHS, BY RACE. MARYLAND AREAS, 1959

Area of Residence	DEATHS UNDER AGE ONE						MATERNAL DEATHS			STILLBIRTHS *		
	Total			Under 28 days								
	Total	White	Non-White	Total	White	Non-White	Total	White	Non-White	Total	White	Non-White
Maryland State	2,209	1,370	839	1,609	1,061	548	26	15	11	1,265	857	408
Baltimore City	847	315	532	607	231	376	8	2	6	441	192	249
Total Counties	1,362	1,055	307	1,002	830	172	18	13	5	824	665	159
Allegany	36	35	1	25	25	—	3	3	—	23	21	2
Anne Arundel	135	102	33	97	83	14	1	1	—	75	55	20
Baltimore	269	252	17	218	204	14	2	2	—	156	141	15
Calvert	13	3	10	7	1	6	1	—	1	14	4	10
Caroline	11	3	8	9	3	6	—	—	—	10	3	7
Carroll	27	22	5	18	18	—	—	—	—	16	15	1
Cecil	40	35	5	31	29	2	—	—	—	11	11	—
Charles	35	4	31	20	3	17	—	—	—	19	11	8
Dorchester	21	9	12	13	5	8	—	—	—	10	5	5
Frederick	38	30	8	25	19	6	—	—	—	30	26	4
Garrett	17	17	—	14	14	—	—	—	—	9	9	—
Harford	48	39	9	32	27	5	1	1	—	28	24	4
Howard	32	25	7	23	19	4	—	—	—	13	7	6
Kent	16	7	9	7	4	3	—	—	—	6	4	2
Montgomery	165	145	20	136	122	14	1	—	1	111	106	5
Prince Georges	250	197	53	184	156	28	6	5	1	187	159	28
Queen Annes	16	8	8	12	7	5	—	—	—	6	3	3
Saint Marys	39	27	12	30	22	8	—	—	—	25	13	12
Somerset	18	6	12	9	2	7	1	—	1	10	4	6
Talbot	17	8	9	9	5	4	—	—	—	6	4	2
Washington	47	46	1	35	34	1	1	1	—	23	23	—
Wicomico	48	25	23	32	20	12	1	—	1	23	13	10
Worcester	24	10	14	16	8	8	—	—	—	13	4	9

* Stillbirths are reported when the periods of gestation are 20 weeks or over.

Table G

BIRTHS BY ATTENDANT AND RACE, WITH PER CENT PHYSICIAN ATTENDED. MARYLAND AREAS, 1959

Area of Residence	DELIVERIES BY ALL ATTENDANTS			PHYSICIAN			MIDWIFE			OTHER ATTENDANT			PER CENT PHYSICIAN ATTENDED		
	Total	White	Non-White	Total	White	Non-White	Total	White	Non-White	Total	White	Non-White	Total	White	Non-White
Maryland State ..	77,165	59,538	17,627	76,297	59,406	16,891	758	86	672	110	46	64	98.9	99.8	95.8
Baltimore City ..	23,893	12,577	11,316	23,754	12,555	11,199	85	16	69	54	6	48	99.4	99.8	99.0
Total Counties ..	53,272	46,961	6,311	52,543	46,851	5,692	673	70	603	56	40	16	98.6	99.8	90.2
Allegany	1,667	1,643	24	1,663	1,639	24	—	—	—	4	4	—	99.8	99.8	100.0
Anne Arundel ...	5,058	4,197	861	5,019	4,189	830	31	6	25	8	2	6	99.2	99.8	96.4
Baltimore	11,993	11,495	498	11,985	11,487	498	1	1	—	7	7	—	99.9	99.9	100.0
Calvert	457	197	260	451	197	254	5	—	5	1	—	1	98.7	100.0	97.7
Caroline	435	307	128	414	307	107	21	—	21	—	—	—	95.2	100.0	83.6
Carroll	1,110	1,055	55	1,108	1,053	55	—	—	—	2	2	—	99.8	99.8	100.0
Cecil	1,281	1,176	105	1,279	1,175	104	—	—	—	2	1	1	99.8	99.9	99.0
Charles	975	549	426	761	539	222	211	9	202	3	1	2	78.1	98.2	52.1
Dorchester	560	336	224	486	336	150	74	—	74	—	—	—	86.8	100.0	67.0
Frederick	1,602	1,431	171	1,595	1,426	169	6	4	2	1	1	—	99.6	99.7	98.8
Garrett	444	444	—	432	432	—	10	10	—	2	2	—	97.3	97.3	—
Harford	2,121	1,858	263	2,120	1,857	263	—	—	—	1	1	—	99.9	99.9	100.0
Howard	857	743	114	857	743	114	—	—	—	—	—	—	100.0	100.0	100.0
Kent	375	252	123	375	252	123	—	—	—	—	—	—	100.0	100.0	100.0
Montgomery	7,848	7,450	398	7,842	7,444	398	—	—	—	6	6	—	99.9	99.9	100.0
Prince Georges ..	10,224	9,042	1,182	10,215	9,037	1,178	3	1	2	6	4	2	99.9	99.9	99.7
Queen Annes	362	243	119	359	242	117	3	1	2	—	—	—	99.2	99.6	98.3
Saint Marys	1,430	1,120	310	1,330	1,088	242	99	31	68	1	1	—	93.0	97.1	78.1
Somerset	403	192	211	322	191	131	81	1	80	—	—	—	79.9	99.5	62.1
Talbot	467	324	143	463	323	140	4	1	3	—	—	—	99.1	99.7	97.9
Washington	1,894	1,835	59	1,886	1,827	59	—	—	—	8	8	—	99.6	99.6	100.0
Wicomico	1,141	769	372	1,134	768	366	6	1	5	1	—	1	99.4	99.9	98.4
Worcester	568	303	265	447	299	148	118	4	114	3	—	3	78.7	98.7	55.8

Table H

BIRTHS BY HOSPITALIZATION AND RACE. MARYLAND AREAS, 1959

Area of Residence	ALL BIRTHS			HOSPITAL BIRTHS			PER CENT HOSPITAL			LOCATION OF HOSPITAL			
	Total	White	Non-White	Total	White	Non-White	Total	White	Non-White	Same County	Other County	Other State	Balto. City
Maryland State	77,165	59,538	17,627	75,445	59,006	16,439	97.8	99.1	93.3	21,265	4,479	11,443	38,258
Baltimore City	23,893	12,577	11,316	23,391	12,456	10,935	97.9	99.0	96.6	—	219	117	23,055
Total Counties	53,272	46,961	6,311	52,054	46,550	5,504	97.7	99.1	87.2	21,265	4,260	11,326	15,203
Allegany	1,667	1,643	24	1,655	1,631	24	99.3	99.3	100.0	1,532	2	117	4
Anne Arundel	5,058	4,197	861	4,979	4,159	820	98.4	99.1	95.2	2,340	143	160	2,336
Baltimore	11,993	11,495	498	11,915	11,437	478	99.3	99.5	96.0	3	167	180	11,565
Calvert	457	197	260	446	196	250	97.6	99.5	96.1	360	57	13	16
Caroline	435	307	128	406	303	103	93.3	98.7	80.5	—	310	93	3
Carroll	1,110	1,055	55	1,054	1,012	42	94.9	95.9	76.4	1	240	407	406
Cecil	1,281	1,176	105	1,269	1,165	104	99.1	99.1	99.0	891	258	103	17
Dorchester	975	549	426	749	532	217	76.8	96.9	50.9	333	114	289	13
Charles	560	336	224	481	336	145	85.9	100.0	64.7	408	57	15	1
Frederick	1,602	1,431	171	1,578	1,411	167	98.5	98.6	97.7	1,213	70	284	11
Garrett	444	444	—	424	424	—	95.5	95.5	—	299	42	83	—
Harford	2,121	1,858	263	2,085	1,833	252	98.3	98.7	95.8	1,751	18	37	279
Howard	857	743	114	837	732	105	97.7	98.5	92.1	—	393	27	417
Kent	375	252	123	373	251	122	99.5	99.6	99.2	323	25	19	6
Montgomery	7,848	7,450	398	7,825	7,431	394	99.7	99.7	99.0	3,720	136	3,950	19
Prince Georges	10,224	9,042	1,182	10,147	9,003	1,144	99.2	99.6	96.8	3,543	1,315	5,228	61
Queen Annes	362	243	119	344	236	108	95.0	97.1	90.7	—	317	20	7
Saint Marys	1,430	1,120	310	1,324	1,082	242	92.6	96.6	78.1	1,235	24	36	29
Somerset	403	192	211	313	188	125	77.7	97.9	59.2	152	155	4	2
Talbot	467	324	143	457	322	135	97.9	99.4	94.4	428	14	10	5
Washington	1,894	1,835	59	1,869	1,812	57	98.7	98.7	96.6	1,644	12	208	5
Wicomico	1,141	769	372	1,127	765	362	98.8	99.5	97.3	1,089	9	29	—
Worcester	568	303	265	397	289	108	69.9	95.4	40.7	—	382	14	1

APPENDIX III

Ph.D.'s AWARDED IN 1957, 1958, 1959

Source: Prepared for the subcommittee by: Resources Analysis Section, Office of Program Planning, NIH, February 1961

PH.D.'S AWARDED IN 1957, 1958, 1959

Schools	Total Ph.D.'s			Ph.D.'s in Selected Science Fields [1]			1959			
	1957	1958	1959	1957	1958	1959	Psychology	Biological Sciences	Chemistry	Physics
All Schools	8,756	8,942	9,360	3,103	3,098	3,168	635	1,042	1,009	482
Maryland	82	102	90	42	53	40	4	11	15	10
Johns Hopkins	87	82	78	30	31	29	3	12	2	12
Georgetown	28	44	38	17	14	7	—	—	7	—
Geo. Washington	35	32	23	21	18	9	3	6	—	—
American U.	28	29	29	4	—	4	4	—	—	—
Catholic U.	83	107	76	29	22	24	3	8	8	5
Howard	—	2	3	—	2	3	—	—	3	—
Delaware	20	21	15	14	17	12	—	—	12	—
Med. Col. of Va.	3	3	2	3	3	—	—	—	—	—
U. of Virginia	42	36	44	23	17	20	4	4	5	7

[1] Includes Psychology, Biological Sciences, Chemistry and Physics.

Source: Earned Degrees, 1956-57, 1957-58, 1958-59. Office of Education, Washington, D. C.

APPENDIX IV

EARNED DEGREES—UNITED STATES AND MARYLAND

Table A Earned Degrees by Level, by Sex, by Institution: 1958-1959—Biological Sciences

Table B Earned Degrees, by Level, by Sex, by Institution: 1958-1959

Table C Earned Degrees, by Level, by Sex: 1957-1958 and 1958-1959

Source: *Earned Degrees Conferred 1958-1959, Bachelor's and Higher Degrees*, U. S. Department of Health, Education, and Welfare, Office of Education, Tables 13, 17, 18

Earned Degrees Conferred by Higher Educational Institutions, 1957-1958, U. S. Department of Health, Education, and Welfare, Office of Education. Circular No. 570, Table 18

Table A

EARNED DEGREES, BY LEVEL, BY SEX, BY INSTITUTION, 1958-1959
BIOLOGICAL SCIENCES

Institution	Bachelor's and 1st-professional degrees		2d-level degrees (master's, except 1st-professional)		Doctorate (Ph.D., Ed.D., etc.)	
	Men	Women	Men	Women	Men	Women
PRE-MED., PRE-DENTAL and PRE-VET. SCI.						
United States	3,386	211	19	2	3	0
Maryland:	100	1	0	0	0	0
Johns Hopkins Univ...	58	—	—	—	—	—
Loyola College	14	—	—	—	—	—
U. of Maryland	23	1	—	—	—	—
Western Md. Col.	5	—	—	—	—	—
BIOLOGY, GENERAL						
United States	5,177	2,357	367	150	118	29
Maryland:	47	48	3	1	4	0
Col. of Notre Dame...	—	14	—	—	—	—
Goucher	—	4	—	—	—	—
Hood College	—	13	—	—	—	—
Johns Hopkins Univ...	4	—	3	1	4	—
Loyola College	5	—	—	—	—	—
Morgan State Col.	9	3	—	—	—	—
Mt. St. Mary's Col.	18	—	—	—	—	—
St. Joseph Col.	—	5	—	—	—	—
U. of Maryland	—	1	—	—	—	—
Washington Col.	6	4	—	—	—	—
Washington Miss. Col.	2	1	—	—	—	—
Western Md. Col.	3	3	—	—	—	—
ZOOLOGY, GENERAL						
United States	1,551	576	279	91	131	13
Maryland:	27	6	5	1	3	0
U. of Maryland	24	6	5	1	3	—
Washington Miss. Col.	3	—	—	—	—	—
ANATOMY & HISTOLOGY						
United States	113	25	50	9	32	5
Maryland	0	0	0	0	0	0
BACTERIOLOGY, VIROLOGY, MYCOLOGY, PARASITOLOGY						
United States	247	257	144	60	109	16
Maryland:	13	7	7	2	7	3
Johns Hopkins Univ...	—	—	1	1	2	2
U. of Maryland	13	7	6	1	5	1

Table A (Contd)

Institution	Bachelor's and 1st-professional degrees		2d-level degrees (master's, except 1st-professional)		Doctorate (Ph.D., Ed.D., etc.)	
	Men	Women	Men	Women	Men	Women
BIOCHEMISTRY						
United States	123	23	79	38	121	18
Maryland	0	0	0	0	0	0
BIOPHYSICS						
United States	10	0	4	0	17	0
Maryland	0	0	0	0	0	0
ENTOMOLOGY						
United States	139	8	128	8	70	2
Maryland:	7	1	3	0	3	0
Johns Hopkins Univ...	—	—	1	—	2	—
U. of Maryland	7	1	2	—	1	—
GENETICS						
United States	3	0	29	6	40	2
Maryland	0	0	0	0	0	0
PHYSIOLOGY (except plant physiology)						
United States	42	45	72	23	53	10
Maryland:	0	5	0	0	0	1
Goucher	—	5	—	—	—	—
Johns Hopkins Univ...	—	—	—	—	—	1
BIOLOGICAL SCIENCES (all other)						
United States	214	22	112	12	35	3
Maryland:	0	0	0	0	0	1
Johns Hopkins Univ...	—	—	—	—	—	1

Table B

EARNED DEGREES, BY LEVEL, BY SEX, BY INSTITUTION: 1958-1959

Institution	Bachelor's and 1st-professional degrees		2d-level degrees (master's, except 1st-professional)		Doctorate (Ph.D., Ed.D., etc.)	
	Men	Women	Men	Women	Men	Women
United States	254,868	130,283	47,321	22,176	8,371	989
Maryland:	3,471	1,688	495	177	144	24
Col. of Notre Dame	—	100	—	—	—	—
Coppin S.T.C.	7	53	—	—	—	—
Eastern C. of Com. & Law	55	4	—	—	—	—
Goucher College	—	146	—	—	—	—
Hood College	—	107	—	—	—	—
Johns Hopkins U.	400	57	168	57	67	11
Loyola College	189	4	17	13	—	—
Md. Inst. Art & Des.	9	10	1	—	—	—
Md. S.T.C. Bowie	19	27	—	—	—	—
Md. S.T.C. Frostburg	54	52	—	—	—	—
Md. S.T.C. Salisbury	27	33	—	—	—	—
Md. S.T.C. Towson	62	199	—	—	—	—
Morgan State Col.	129	118	—	—	—	—
Mt. St. Agnes Col.	—	60	—	—	—	—
Mt. St. Mary's Col.	136	14	—	—	—	—
Peabody Institute	9	7	3	4	—	—
St. Johns College	15	7	1	—	—	—
St. Joseph College	—	69	—	—	—	—
St. Mary's Seminary	140	—	23	—	—	—
University of Balto.	281	5	—	—	—	—
University of Md.	1,712	445	229	92	77	13
Washington Col.	64	28	—	—	—	—
Washington Miss. Col.	42	64	—	—	—	—
Western Md. College	61	79	30	11	—	—
Woodstock College	60	—	23	—	—	—

Table C

EARNED DEGREES, BY LEVEL, BY SEX: 1957-1958 AND 1958-1959

	Bachelor's and 1st-professional degrees			2d-level degrees (master's except 1st-professional)			Doctorates (Ph.D., Ed.D., etc.)		
	1957-58	1958-59	% change *	1957-58	1958-59	% change *	1957-58	1958-59	% change *
Continental United States.	362,554	381,923	5.1	65,487	69,364	5.6	8,938	9,356	4.5
Men	240,990	252,960		44,151	47,224		7,974	8,367	
Women	121,564	128,963		21,336	22,140		904	989	
Maryland	4,989	5,159	3.3	651	672	3.2	186	168	—9.7
Men	3,291	3,471		485	495		167	144	
Women	1,698	1,688		166	177		19	24	

* Calculated by subcommittee staff.

APPENDIX V

Ph.D.: BACCALAUREATE ORIGINS IN THE UNITED STATES 1936-1956 FROM MARYLAND ACADEMIC INSTITUTIONS

Source: Prepared for the subcommittee by: Resources Analysis Section, Office of Program Planning, NIH, February 1961

Ph.D.: BACCALAUREATE ORIGINS IN THE U.S. 1936-1956 FROM MARYLAND ACADEMIC INSTITUTIONS

Maryland Schools	(Biological Sciences)	Natural Sciences	Social Sciences Arts & Humanities	Grand Total All Disciplines
U. of Baltimore	—	—	1	1
Defunct Institute	—	1	5	6
Goucher Coll.	(25)	36	35	71
Hood College	(5)	5	7	12
Johns Hopkins U.	(59)	292	134	426
Loyola College	(3)	22	10	32
Maryland Inst. School of Art & Design	—	—	1	1
Maryland State Teachers College (Frostburg)	—	—	2	2
Maryland State Teachers College (Salisbury)	—	—	1	1
Maryland State Teachers College (Towson)	—	—	7	7
U. of Maryland	(143)	248	71	319
Morgan State Coll.	(2)	4	12	16
Mt. St. Agnes Coll.	(1)	1	—	1
Mt. St. Mary's Coll.	(3)	6	5	11
Notre Dame College	(2)	4	9	13
Peabody Institute	—	—	3	3
St. John's College	(3)	16	17	33
St. Joseph Coll.	—	—	8	8
St. Mary's Sem & College	—	—	27	27
U. S. Naval Academy	(3)	35	23	58
Washington Coll.	(3)	17	14	31
Western Maryland Coll.	(9)	16	23	39
Woodstock College	—	4	32	36

APPENDIX VI

WHERE MARYLANDERS GO TO MEDICAL SCHOOL

Source: JAMA, Nov. 12, 1960, p. 1448f

WHERE MARYLANDERS GO TO MEDICAL SCHOOL

Total Maryland students in recent year	130
Schools entered:	
University of Maryland	77
University of Michigan	1
State University of New York, New York City	1
Medical College of Virginia	2
College of Medical Evangelists	2
University of Southern California	1
Stanford University	1
Yale University	2
Georgetown University	12
George Washington University	5
Harvard University	3
Emory University	1
The Johns Hopkins University	9
Howard University	3
Washington University	1
New York Medical College	1
Duke University	3
Jefferson Medical College	2
University of Pennsylvania	2
Dartmouth	1
	130

APPENDIX VII

UNDERGRADUATE REQUIREMENTS FOR MEDICAL SCHOOL ADMISSION

Source: *Admission Requirements of American Medical Colleges Including Canada, 1960-1961* (Association of American Medical Colleges)

UNDERGRADUATE REQUIREMENTS FOR MEDICAL SCHOOL ADMISSION

COLLEGE WORK REQUIRED AND RECOMMENDED FOR ENTRANCE

College work *	Number of schools (N=87) Requiring	Recommending
2 years	1	0
3 years	77	0
4 years	6	55
Unspecified	3	—

* Regardless of number of years required, 9 schools require a bachelor's degree or candidacy for it and 50 schools recommend it.

FIRST-YEAR STUDENTS COMPLETING FOUR YEARS OF PREMEDICAL WORK

Estimated % of 1960-61 1st year students with 4 premedical years	Number of schools
90-100%	39
80-89	20
70-79	7
60-69	8
50-59	7
Less than 50%	6
Total schools	87

OBSERVED AREAS OF WEAKNESS IN PREMEDICAL PREPARATION (N=87; multiple response)

Weak areas	Number of schools
Mathematics	54
Humanities	27
Chemistry	22
Communication skills	22
Social & behavioral sciences	20
Physics	18
Biological sciences	6
Other	2
No general weakness	4
No response	13

APPENDIX VIII

EXCERPTS—H. R. 4999
87th CONGRESS, 1st SESSION

EXCERPTS—H. R. 4999

87th CONGRESS, 1st SESSION

IN THE HOUSE OF REPRESENTATIVES

February 28, 1961

Mr. Harris introduced the following bill; which was referred to the Committee on Interstate and Foreign Commerce

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A BILL

To increase the opportunities for training of physicians, dentists, and professional public health personnel, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United State of America in Congress assembled,
That this Act may be cited as the "Health Professions Educational Assistance Act of 1961.". . .

"PART C—SCHOLARSHIP GRANTS TO SCHOOLS OF MEDICINE, OSTEOPATHY, OR DENTISTRY

"SCHOLARSHIP GRANTS

"SEC. 740. (a) The Surgeon General shall make grants to each public or other nonprofit school of medicine, osteopathy, or dentistry (as defined in section 724), which is accredited as provided in section 721 (b) (2), for scholarships to be awarded annually by such school to students thereof.

"(b) The amount of the grant under subsection (a) to each such school shall be equal to $1,500 multiplied by (1) for the fiscal year ending June 30, 1962, one-fourth of the number of first-year students of such school; (2) for the fiscal year ending June 30, 1963, one-fourth of number of first-year students and second-year students of such school; (3) for the fiscal year ending June 30, 1964, one-fourth of the number of first-year students, second-year students, and third-year students of such school; and (4) for each fiscal year thereafter, one-fourth of the number of students of such school.

"(c) (1) Scholarships may be awarded by schools from grants under subsection (a) only to individuals who have been accepted by them for enrollment as full-time first-year students in the case of awards from grants under subsection (a) for the fiscal year ending June 30, 1962; only to individuals who have been so accepted and individuals enrolled and in good standing as full-time second-year students in the case of such awards from such grants for the fiscal year ending June 30, 1963; and only to individuals so accepted or enrolled and individuals enrolled and in good standing as full-time third-year students in the case of such awards from such grants for the fiscal year ending June 30, 1964; and thereafter only to individuals who have been so accepted and individuals who are enrolled as full-time students in the school.

"(2) Scholarships awarded from grants under subsection (a) for any school year shall be awarded to talented students on the basis of need for financial assistance in pursuing a course of study at the school for such year. Any such scholarship awarded for a school year shall cover such portion of the student's tuition, fees, books, equipment, and living expenses at the school making the award, but not to exceed $2,000 for any year, as such school may determine the student needs for such year on the basis of his requirements and financial resources.

"(d) The Surgeon General shall also make cost of education payments to schools which receive grants under subsection (a). Such payments to any school for a year shall be equal to $1,000 for each of its students who is awarded a scholarship from a grant under subsection (a) for such year, but not in excess of the number of students determined for such school for such year under clause (1), (2), (3), or (4), as the case may be, of subsection (b).

"(e) Grants under subsection (a) and payments under subsection (d) shall be made in accordance with regulations prescribed after consultation with the National Advisory Council on Education for the Health Professions (established by section 725). Such regulations shall include provisions relating to determination, for purposes of grants or payments for a fiscal year, of the number of students enrolled in a particular year-class on the basis of estimates, or on the basis of the number in such year-class in an earlier year, or on such other basis as he deems appropriate for making such determination, and including methods of making such determination when a year-class was not in existence in an earlier year at a school.

"(f) Grants under subsection (a) and payments under subsection (d) may be paid in advance or by way of reimbursement, and at such intervals as the Surgeon General may find necessary; and with appropriate adjustments on account of overpayments or underpayments previously made."

APPENDIX IX

POSTGRADUATE COURSES AVAILABLE TO PHYSICIANS

Source: University of Maryland School of Medicine
The Johns Hopkins University School of Medicine

POSTGRADUATE COURSES AVAILABLE TO PHYSICIANS

UNIVERSITY OF MARYLAND
1960-1961

1. Advances in Medical Science. Jan. 11—May 24, 1961. 2 hours every Wednesday afternoon for 19 weeks. 52 physicians. The topics this year include:

   The Scientific Method
   The Action of Drugs on Cells
   Radioisotopes in Diagnosis and Therapy
   The Concentrative Mechanism of the Kidney
   The Body Fluids
   Clinical Case Presentations of Problems in Fluid and Electrolyte Balance
   Ventilation of the Lung, Gas Distribution and Diffusion
   Acute Respiratory Failure and CO_2 Narcosis
   Disorders of the Pituitary Gland
   Diagnostic Approach to Amenorrhea
   Adrenal Cortical Physiology
   Diseases of the Adrenal Cortex; Diagnosis and Management
   Considerations in the Use of Digitalis and Quinidine
   Cardiac Emergencies
   Newer Concepts in Coronary Artery Disease: Epidemiology and Diagnosis
   Acute Treatment and Long Term Management
   Cardiac Surgery in Valvular Heart Disease: Evaluation and Selection of Patients
   Surgical Considerations
   Recent Advances in Virology
   Febrile Virus Diseases
   Viruses and Tumors
   Recent Advances in Mycology: Mycologic Diagnosis of the Deep Mycoses
   Clinical Features and Management
   Hemoglobinopathies
   Disorders of Blood Coagulation
   Blood Groups (Recent Advances)
   Hemolytic Anemia
   Advances in Anesthesia
   Resuscitation
   The Metabolism of Diabetes Mellitus
   Diagnosis and Management of Diabetes
   Advances in Neurology: The Management of Parkinsonism
   Chronic and Acute Arterial Insufficiency
   Thromboembolic Disease

2. Basic Electrocardiography. Jan. 19-21, 1961. 32 physicians.
3. Clinical Practice. March 6-10, 1961. (Cancelled because of inadequate enrollment).
4. Neuropathology for Pathologists. 5 week-ends, one each in Nov., Dec., Jan., Feb., March, 1961. (Cancelled because of inadequate enrollment).
5. Clinical Anatomy. Jan.-May, 1961. Mondays and Wednesdays for 15 weeks. 90 hours total. 11 physicians.
6. Annual Pediatric Seminar. April 9, 1961. 150 physicians.
7. Frederick Program. Monthly visits to Frederick Memorial Hospital by University of Maryland Faculty in Medicine and Surgery.
8. Hagerstown Program. Monthly visits to Washington County Hospital by University of Maryland Faculty in Medicine.

9. Easton Program. Monthly visits to Easton Memorial Hospital by University of Maryland Faculty in Obstetrics and Gynecology.
10. Salisbury Program. Monthly visits to Peninsula General Hopsital by University of Maryland Faculty in Obstetrics and Gynecology, and Surgery.

Next year in addition to maintaining all of the above activities, except for the one week course in Clinical Practice, the University of Maryland plans to offer:

Pediatrics. Time indefinite.
Hematology. March 8-9, 1962
Endocrinology. January 12-13, 1962
Clinical Cardiology. February 1-2-3, 1962

THE JOHNS HOPKINS UNIVERSITY

1961

1. Clinical Thursdays—Spring sessions on April 13, May 11, and June 8. Time 10:30 A.M. to 3:30 P.M. 12 hours total. Fall Session will also be offered. 175 physicians. The topics in the spring sessions include:

Therapy of New Born Crises
Diarrhea in Infancy and Childhood
Differentiation of Causes of Jaundice
Clinic on Management of Anemia
A Philosophy of Pelvic Surgery
Treatment of Rheumatoid Arthritis
Abdominal Enlargement in Children
Alopecia
Prevention of Tetanus
Therapy of Chronic Bronchitis
Surgical Suitability of Cardiac Patients
Use of Diuretics
Clinic on Auscultation of the Heart
Medical Radioisotope Scanning
The Dizzy Patient
Thyroid Dysfunction
Surgery for Carotid Artery Stenosis
Appraisal of Anti-Depressive Drugs
New Drugs for Diabetes
Methods of Resuscitation
Panel on the Menopause
Extra-pulmonary Signs of Lung Cancer
Appraisal of Recent Antibiotics

2. Topics in Clinical Medicine. May 15-20, 1961. Time 9:00 A.M. to 5:00 P.M. 42 hours total. 175 physicians. The topics include:

Clinic on the Management of Hematologic Neoplasms
The Spleen
Effects of Human Growth Hormone in Treating Hypopituitarism
ACTH Test and SU4885 Test in Adrenal Insufficiency
Endocrine Factors in Obesity
Prediabetic Renal Disease
Estrogen Therapy of the Postmenopausal Woman
Exophthalmos—A Reconsideration
Panel on Traumatic Heart Disease

Natural History of Unoperated Congenital Cardiac Defects
Results of Pregnancy in Patients with Congenital Heart Disease
Treatment of Aortic Insufficiency with Leaflet Replacement
Endarterectomy for Arterial Occlusive Disease
Cineangiography in the Study of Patients with Coronary Insufficienc
An Evaluation of Diet Therapy of Coronary Artery Disease
Some Clinically Significant Auscultatory Phenomenon
Usefulness of Vectors
Obstructive Emphysema as a Complication of Patent Ductus Arteriosus
Panel on the Management of Hypertension
Mucormycosis
Clinical Manifestations of Enterovirus Infections
Chemotherapy of Viral Infections
Congenital Viral Infections
Studies on Infectious Hepatitis Virus
Influence of Diet Upon Murine Viral Hepatitis
Clinical Pathological Conference
The 1960 Baltimore Polio Epidemic
Mode of Action of Antihelminthics
Evaluation of Recent Antibiotics
Experimental Transmission of Leprosy
Panel on the Treatment of Pulmonary Tuberculosis
Needle Liver Biopsy-Value and Abuse
The Acid Perfusion Test in Peptic Esophagitis
Effectiveness of Gluten Free Diet in Sprue
Sarcoma of the Stomach
Electron Microscopic Observations in Whipples Disease
Cytopathologic Diagnosis of Malignant Cells in Pleural Effusions
Medical Radioisotope Scanning
Panel on Dangerous Drugs
Clinical Aspects of Some Hereditary Syndromes
Mast Cells in Disease
Alopecia
Nonpulmonary Manifestations of Pulmonary Carcinoma

3. Special Interest Clinics. Each week from September to June the clinical departments hold regularly scheduled conferences and rounds at which patients of special interest are presented. Any physician in the Baltimore area is invited to attend.

APPENDIX X

INVENTORY OF PROFESSIONAL SCHOOLS IN MARYLAND-DISTRICT OF COLUMBIA

INVENTORY OF PROFESSIONAL SCHOOLS

PROFESSION	MARYLAND	DISTRICT OF COLUMBIA
Dentistry	Baltimore—University of Maryland	Georgetown University Howard University
Dietetics	—	Freedmen's Hospital Walter Reed Army Hospital
Librarianship	—	Catholic University of America Department of Library Science
Medical Records (Librarians)	Baltimore—U.S. Public Health Service Hospital	—
Medical Record (Technicians)	Baltimore—Sinai Hospital	—
Medical Technology	Baltimore—Mercy Hospital St. Joseph's Hospital Union Memorial Hospital Easton—Memorial Hospital Hagerstown—Washington County Hospital	Doctors Hospital George Washington University Hospital Providence Hospital Sibley Memorial Hospital Washington Hospital Center Washington Sanitarium & Hospital
Medicine	Baltimore—Johns Hopkins University University of Maryland	Georgetown University George Washington University Howard University College of Medicine
Nurse Anesthetists	Baltimore—Johns Hopkins Hospital	Walter Reed Army Hospital
Nursing—Practical	Annapolis—Anne Arundel General Hospital Baltimore—Baltimore City Hospitals Mergenthaler High School South Baltimore General Hosp. University of Maryland Cambridge—Cambridge-Maryland Hospital Eastern Shore State Hosp. Cheverly—Prince George's General Hosp. Crownsville—Crownsville State Hospital Henryton—Henryton State Hospital Owings Mills—Rosewood State Training School Sykesville—Springfield State Hospital	Georgetown University Hospital Hannah Harrison School Anna Burdick Vocational High School Margaret Murray Washington Vocational High School

Nursing—Professional	Baltimore—Bon Secours Hospital Church Home and Hospital Franklin Square Hospital Johns Hopkins Hospital Lutheran Hospital of Md. Maryland General Hospital Mercy Hospital Mount St. Agnes College Provident Hospital St. Agnes Hospital St. Joseph's Hospital Sinai Hospital Union Memorial Hospital University of Maryland Cumberland—Memorial Hospital Easton—Memorial Hospital Emmitsburg—St. Joseph College Frederick—Frederick Memorial Hospital Hagerstown—Washington County Hosp. Salisbury—Peninsula General Hospital Takoma Park—Washington Missionary College	Catholic University of America District of Columbia General Hosp. Freedmen's Hospital Georgetown University Sibley Memorial Hospital Washington Hospital Center
Pharmacy	Baltimore—University of Maryland	George Washington University Howard University
Physical Therapy	Baltimore—University of Maryland School of Medicine	—
Public Health	Baltimore—Johns Hopkins University, School of Hygiene and Public Health	—
Social Work	Baltimore—University of Maryland	Catholic University of America National Catholic School of Social Service Howard University, School of Social Work
X-Ray Technology	Annapolis—Anne Arundel General Hosp. Baltimore—Baltimore City Hospitals Johns Hopkins Hospital St. Agnes Hospital Sinai Hospital South Baltimore General Hosp. University Hospital Bethesda—U. S. Naval Hospital Hagerstown—Washington County Hosp. Salisbury—Peninsula General Hosp.	Georgetown University Hospital